Preview: ITEC5030 : Emerging Technologies

Syllabus

Course Overview

This course introduces you to emerging technologies. You will conduct scanning activities for emerging technologies and apply the use of emerging technologies through a theoretical framework. In addition, you will perform hands-on activities in the implementation and management of these technologies and will explore the applicability of various emerging technologies in various scenarios.

You will also learn about layer 3 IPv6 addressing that is becoming so critical as more devices get "pushed out" to the Internet. You will engage in various security approaches against emerging technology threats to the network. Finally, you will explore various tunneling techniques using advanced protocols to complement the concept of an "Internet of Things" home-based network.

Course Competencies   (Read Only)

To successfully complete this course, you will be expected to:

1. Conduct scanning activities to select and evaluate emerging technologies that address organization needs.

2. Apply technology theories and models to inform the development of an implementation plan for new technology.

3. Analyze the challenges of implementing new technologies with existing infrastructures and processes.

4. Advocate effectively for the acquisition of new and emerging technologies with decision makers.

5. Communicate effectively with key technical and non-technical stakeholders.

- Regalado, A. (2017). Reversing paralysis. *MIT Technology Review, 120*(2), 82–87.
- Sampson, A. (2017). CompTIA Network+ N10-007: Internet of Things (IoT) [Video]. Skillsoft.
- Schneier, B. (2017). Botnets of things. *MIT Technology Review, 120*(2), 88–91.
- Shannon, M. (n.d.). Deploying mobile devices securely. Skillsoft.
- Shannon, M. (n.d.). Identify and access management controls. Skillsoft.
- SWOT analysis. In S. D. Hill (Ed.), *Encyclopedia of management* (7th ed.). Detroit: Gale, Cengage Learning.
- Temple, J. (2017). Hot solar cells. *MIT Technology Review, 120*(2), 52–57.
- Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review. *Journal of Enterprise Information Management, 28*(3), 443–488.
- Woyke, E. (2017). The 360-degree selfie. *MIT Technology Review, 120*(2), 36–47.

External Resource

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- Artificial intelligence. (n.d.). *New York Times* [Topic search results]. Retrieved from https://www.nytimes.com/topic/subject/artificial-intelligence
- Artificial intelligence. (n.d.). *Tech Republic* [Topic search results]. Retrieved from https://www.techrepublic.com/topic/artificial-intelligence/
- Balchunas, A. (2007). Overview of IPSEC. Retrieved from http://www.routeralley.com/guides/ipsec_overview.pdf
- Belluck, P. (2017). First digital pill approved to worries about biomedical 'big brother.' Retrieved from https://www.nytimes.com/2017/11/13/health/digital-pill-fda.html
- Bureau, S. (2017). RIT team creates high-speed internet lane for emergency situations. Retrieved from https://www.rit.edu/news/story.php?id=61939
- Chavez, M. (2014). Understanding IPSEC. Retrieved from https://www.youtube.com/watch?v=Mt_JlQFeU2Q
- Chertoff, M. (n.d.). Over the horizon: Emerging security threats and risks to the enterprise. Retrieved from https://www.securitymagazine.com/articles/88352-over-the-horizon-emerging-security-threats-and-risks-to-the-enterprise
- CISCO Networking Academy. (n.d.). Introduction to Packet Tracer. Retrieved from https://www.netacad.com/courses/intro-packet-tracer/
- Cole, A. (2017). An introduction to blockchain technology. Retrieved from https://www.techopedia.com/an-introduction-to-blockchain-technology/2/32548
- Columbus, L. (2016). Forrester's top 15 emerging technologies to watch, 2017-2021. Retrieved from https://www.forbes.com/sites/louiscolumbus/2016/09/25/forresters-top-15-

emerging-technologies-to-watch-2017-2021/

- DeNisco Rayome, A. (2017). 6 Tips for integrating AI into your business. Retrieved from https://www.techrepublic.com/article/6-tips-for-integrating-ai-into-your-business/

- Dobinson, C. (2017). How to find and implement emerging technology as a new CIO. Retrieved from https://www.cio.co.uk/cio-career/tips-on-increasing-business-agenda-with-emerging-technology-for-starting-cio-3643008/

- Dow Jones Newswire. (2017). Where wearable tech is headed. Retrieved from http://www.foxbusiness.com/features/2017/10/24/where-wearable-tech-is-headed-wsj.html

- Egan, G. (2017). Five tips from CISOs for managing emerging cybersecurity threats. Retrieved from https://www.wombatsecurity.com/blog/five-tips-from-cisos-for-managing-emerging-cybersecurity-threats

- Google Creative Lab. (n.d.). Teachable machine. Retrieved from https://experiments.withgoogle.com/ai/teachable-machine

- Hardiman, N. (2013). Breaking down an IPv6 address: What it all means. Retrieved from https://www.techrepublic.com/blog/data-center/breaking-down-an-ipv6-address-what-it-all-means/

- Kassner, M. (2015). Biometrics and behavioral tech: The good and the bad security implications. Retrieved from https://www.techrepublic.com/article/biometrics-and-behavioral-tech-the-good-and-the-bad-security-implications/

- Kassner, M. (2015). IPv6: The smart person's guide. Retrieved from https://www.techrepublic.com/article/ipv6-the-smart-persons-guide/

- Kassner, M. (2017). Why bandwidth bottlenecks during disasters may require a new routing protocol. Retrieved from https://www.techrepublic.com/article/why-bandwidth-bottlenecks-during-disasters-may-require-a-new-routing-protocol/

- Krauth, O. (2017). The 6 most in-demand AI jobs, and how to get them. Retrieved from https://www.techrepublic.com/article/the-6-most-in-demand-ai-jobs-and-how-to-get-them/

- KVSP, R. (n.d.). Form 'n' fun. Retrieved from https://experiments.withgoogle.com/android/form-n-fun

- Lee, B. (2017). Wearable technology emerging for chronic pain relief. Retrieved from https://www.forbes.com/sites/brucelee/2017/11/05/wearable-tech-emerging-for-chronic-pain-relief/

- Lever, R. (2017). Privacy fears over artificial intelligence as crime stopper. Retrieved from https://www.yahoo.com/news/privacy-fears-over-artificial-intelligence-crimestopper-015326163.html

- Lucyd. (2017). Lucyd whitepaper. Retrieved from https://icotop.io/wp-content/uploads/2018/01/whitepaper-1.pdf

- Maddox, T. (2016). The future of wearables and their role in the workplace. Retrieved from https://www.techrepublic.com/article/the-future-of-wearables-and-their-role-in-the-workplace/

- Maddox, T. (2017). Smart clothing: Slow but steady growth for consumers and the enterprise. Retrieved from https://www.techrepublic.com/article/smart-clothing-slow-but-steady-growth-for-

consumers-and-the-enterprise/

- Major, C., Fergusson, R., & Carr. V. (n.d.). Molly Wood: Wearable technology beyond the wrist. Retrieved from https://www.dailymotion.com/video/x2r8sap
- Marr, B. (2017). A complete beginner's guide to blockchain. Retrieved from https://www.forbes.com/sites/bernardmarr/2017/01/24/a-complete-beginners-guide-to-blockchain/
- Meola, A. (2016). What is the Internet of Things? Retrieved from http://www.businessinsider.com/what-is-the-internet-of-things-definition-2016-8
- Mile2 - Cyber Security Certifications. (2015). How IPSEC works. Retrieved from https://www.youtube.com/watch?v=doSW8d2iLFM
- Molenaar, R. (n.d.). IPsec (Internet Protocol Security). Retrieved from https://networklessons.com/cisco/ccie-routing-switching/ipsec-internet-protocol-security/
- Montalbano, E. (2017). Smart fabric uses magnetic fields to store, transmit data without electronics. Retrieved from https://www.designnews.com/electronics-test/smart-fabric-uses-magnetic-fields-store-transmit-data-without-electronics/104613276457800
- Morgan, J. (2014). A simple explanation of "The Internet of Things." Retrieved from https://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/
- Motzenbecker, D. (n.d.). Thing translator. Retrieved from https://experiments.withgoogle.com/ai/thing-translator
- Olzak, T. (2007). Reduce multi-factor authentication costs with behavioral biometrics. Retrieved from https://www.techrepublic.com/article/reduce-multi-factor-authentication-costs-with-behavioral-biometrics/
- Patterson, D. (2016). Experts predict 2017's biggest cybersecurity threats. Retrieved from https://www.techrepublic.com/article/experts-predict-2017s-biggest-cybersecurity-threats/
- PBSoffbook. (2013). The future of wearable technology. PBS Digital Studios
- Protalinski, E. (2015). Google plans to propose its QUIC network protocol, which delivers HTTP over UDP, as an Internet standard. Retrieved from https://venturebeat.com/2015/04/17/google-plans-to-propose-its-quic-network-protocol-which-delivers-http-over-udp-as-an-internet-standard/
- Raza, K. (2017). SSL or IPsec: Which is best for IoT network security? Retrieved from https://www.networkworld.com/article/3164531/internet-of-things/ssl-or-ipsec-whats-the-right-approach-for-iot-network-security.html
- Reese, H. (2016). Artificial intelligence: The 3 big trends to watch in 2017. Retrieved from https://www.techrepublic.com/article/3-major-ai-trends-to-watch-in-2017/
- Reuter, R. (2017). Wearable technology in the lean enterprise. Augmented World Expo
- Rosenbaum, E., & Mann, Y. (n.d.). Giorgio cam. Retrieved from https://experiments.withgoogle.com/ai/giorgio-cam
- Rubens, P. (2013). 6 Emerging security threats, and how to fight them. Retrieved from https://www.esecurityplanet.com/network-security/6-emerging-security-threats-and-how-to-fight-

them.html

- Samaradiwakara, G.D.M.N., Gunawardena, C.G. (2014). Comparison of existing technology theories and models to suggest a well improved theory/model. *International Technical Sciences Journal (ITSJ), 1*(1), 21–36.
- Sung, D. (2015). What is wearable tech? Everything you need to know explained. Retrieved from https://www.wareable.com/wearable-tech/what-is-wearable-tech-753
- Thomas, J., & Elbirt, A. J. (2004). IPsec: How it works and why we need it. Retrieved from https://www.computerworld.com/article/2561149/security0/ipsec--how-it-works-and-why-we-need-it.html
- Tracy, M. (2017). Technology used to track players' steps now charts their sleep, too. Retrieved from https://www.nytimes.com/2017/09/22/sports/ncaafootball/clemson-alabama-wearable-technology.html
- World Economic Forum. (2017). Top 10 emerging technologies of 2017. Retrieved from https://www.scientificamerican.com/report/top-10-emerging-technologies-of-20171/

Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

External Resource

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- Brownworth, A. (n.d.). Blockchain Demo (Video). Retrieved from https://anders.com/blockchain/
- Brownworth, A. (n.d.). Blockchain Hands-On Activity Screen. Retrieved from https://anders.com/blockchain/block.html

- Hardesty, L. (2017). <u>Testing new networking protocols.</u> Retrieved from http://news.mit.edu/2017/speed-testing-traffic-management-data-center-networks-0321

Unit 1 ≫ Discovering Emerging Technologies through Scanning Activities

Introduction

Welcome to the course! We start this course with an overview of emerging technologies and an understanding of "scanning activities." A scanning activity is simply understanding new advances in technology and being aware of organizations who are pursuing these new technologies, to include potential threats and benefits. A scanning activity might also include emerging technologies that are under research and development. A scanning activity is often referred to as environmental scanning. During our scan, we also look for best practices.

Organizations should scan the competition to find out how they stack up to competitors and how they can earn a customer's business, particularly with new implementations of emerging technologies. The benefits of an environmental scan are to examine what the "competition" is doing so that your organization can be in touch with trends with emerging technologies.

Environmental scanning uses various models as frameworks. One popular type of model is a "SWOT" analysis. In our environmental scan, SWOT is a framework for identifying Strengths, Weaknesses, Opportunities, and Threats. In the simplest of terms, SWOT serves as a framework for identifying potential advantages and disadvantages of implementing an emerging technology.

The outcomes for this unit are as follows:

- Perform an external environmental scan of an emerging technology.
- Conduct a SWOT analysis from your external scan.
- Discuss emerging technologies and identify best practices.
- Obtain exposure to academic research and writing.
- Create a packet tracer account from Cisco NetAcad.
- Download and install the latest version of Cisco's Packet Tracer.

Learning Activities

u01s1 - Studies

Readings

Use the Capella library to read the following:

- [SWOT analysis.](#) In S. D. Hill (Ed.), *Encyclopedia of management* (7th ed.). Detroit: Gale, Cengage Learning.
- MIT Technology Review, 10 Breakthrough Technologies: 2017
    - Connor, S. (2017). [The cell atlas.](#) *MIT Technology Review, 120*(2), 58–61.
    - Freedman, D. H. (2017). [Self-driving trucks.](#) *MIT Technology Review, 120*(2), 62–71.
    - Juskalian, R. (2017). [Practical quantum computers.](#) *MIT Technology Review, 120*(2), 76–81.
    - Knight, W. (2017) [Paying with your face.](#) *MIT Technology Review, 120*(2), 72–75.
    - Knight, W. (2017). [Reinforcement learning.](#) *MIT Technology Review, 120*(2), 32–35.
    - Mullin, E. (2017). [Gene therapy 2.0.](#) *MIT Technology Review, 120*(2), 48–51.
    - Regalado, A. (2017). [Reversing paralysis.](#) *MIT Technology Review, 120*(2), 82–87.
    - Schneier, B. (2017) [Botnets of things.](#) *MIT Technology Review, 120*(2), 88–91.
    - Temple, J. (2017). [Hot solar cells.](#) *MIT Technology Review, 120*(2), 52–57.
    - Woyke, E. (2017). [The 360-degree selfie.](#) *MIT Technology Review, 120*(2), 36–47.

Use the Internet to review the following:

- Columbus, L. (2016). [Forrester's top 15 emerging technologies to watch, 2017-2021.](#) Retrieved from https://www.forbes.com/sites/louiscolumbus/2016/09/25/forresters-top-15-emerging-technologies-to-watch-2017-2021/
- World Economic Forum. (2017). [Top 10 emerging technologies of 2017.](#) Retrieved from https://www.scientificamerican.com/report/top-10-emerging-technologies-of-20171/

u01s1 - Learning Components

- Demonstrate an understanding of scanning activities for emerging technologies employed at other organizations.
- Identify the potential implementation of an emerging technology at your organization.

u01s2 - Creating your Cisco Network Academy Account and Downloading Packet Tracer

Follow these step-by-step instructions to create your Cisco NetAcad account and download Cisco Packet Tracer:

1. Click the link to open the website: [Introduction to Packet Tracer](#).
2. Scroll down and point your mouse on the "Enroll Now" button. Select "English" to continue.

3. Fill out all the fields on the Sign Up page. When you have entered all your information, click "Create Account" to continue.

4. Click "Launch Course" to continue.

5. Open your email inbox. Find the email Cisco sent to verify your email address and click the "Confirm email address" button.
   - You are now logged into the course.

6. Under the "Resources" tab at the top of the page, click "Download Packet Tracer" to continue.
   - Select the correct download for your computer. There are 32 and 64 bit versions for Windows as well as a Linux version.
   - If you are using a Mac, you will need a virtual environment to run the program.
     - Click this link for instructions: [Installing a Virtual Environment and Windows on a Mac](#).

7. Once you have downloaded the correct version for your computer, open the file and follow the installation steps.
   - **Note:** When you have finished installing, close all your browser windows. This is important to complete the process.

8. Open the Cisco Packet Tracer program from your desktop shortcut or program menu.

9. Log in with the same email address and password you entered on the Sign Up page.
   - You are now logged into Cisco Packet Tracer.

u01a1 - Perform Scanning Activity on an Emerging Technology for your Organization

Assignment Overview

Using the study materials provided in u01s1 and other sources, identify an emerging technology implemented (or in the process of being implemented) at an organization or an emerging technology currently under research and development (not implemented). After identifying an emerging technology, evaluate this technology using a SWOT analysis.

Here are some possible emerging technologies to consider (note: feel free to chose an emerging technology from outside this list).

- Cryptocurrency/blockchain (i.e. Bitcoin/Litecoin).
- FinTech (financial technology).
- Cyber analytics - emerging use of analytics to support cybersecurity.

- Artificial Intelligence/machine learning applications in present and near future use.
- Augmented reality/virtual reality applications.
- Biometric advances.
- Wearable technology.

In addition to the study materials provided in u01s1, the following are excellent resources for finding and identifying emerging technologies: The New York Times and Wall Street Journal technology sections, Tech Republic, The Institute of Electrical and Electronics Engineers (IEEE), and Google Scholar.

Assignment Instructions

Write a 2–3 page paper about this chosen technology for potential use within the organization. Include the benefits and challenges of implementation as well as how the technology meets the needs of the organization.

Ensure your response identifies the strengths, weaknesses, opportunities, and threats of this technology.

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Perform scanning activities on emerging technologies.
- Advocate use of an emerging technology for an organization.
- Demonstrate a critical assessment of chosen technology to include potential benefits and challenges of implementation.
- Communicate key points in a logical, well-organized manner aimed at a focused goal with credit to external sources and meeting the expectations of senior IT leaders.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 2–3 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.

- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

[APA Style and Format](#)

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u01d1 - SWOT Analysis on an Emerging Technology

Scanning activities and emerging technologies go hand-in-hand. One method of performing a scanning activity is through a SWOT analysis. In a SWOT analysis, the strengths, weaknesses, opportunities, and threats to an organization (as a whole) are examined. However, a SWOT analysis can also be used as a scanning activity: to identify an emerging technology and perform an examination of that technology's strengths, weaknesses, opportunities, and threats.

For this week's discussion, identify an emerging technology either being implemented at another organization or currently under research and development for potential adoption at your organization of your choice. The organization can be non-profit, medical, defense-related, educational, public or private, etc. Organize your response per 1) strengths, 2) weaknesses, 3) opportunities, and 4) threats of the emerging technology.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's SWOT analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the SWOT analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

u01d1 - Learning Components

- Perform a critical assessment of an emerging technology (benefits and challenges of implementation).
- Performs self-assessment on organization for potential implementation of emerging technologies.
- Writes in a clear, easy-to-read, scholarly tone.

Unit 2 ▶▶ Blockchain/Cryptocurrency

Introduction

In this unit, we will explore blockchain and cryptocurrency. Blockchain technology offers benefits beyond simple cryptocurrency (secure financial transactions using a digital, decentralized currency). Medical records, legal documents and other business transactions can benefit from blockchain technology. To understand blockchain, imagine a spreadsheet that is duplicated thousands of times across a worldwide network of computers. This spreadsheet can only be updated with new entries (blocks). If existing blocks (past transactions) were edited or hacked, the original SHA256 hash of that block would also be edited, rendering additional (future) blocks invalid (future blocks rely on original SHA256 hashes on prior blocks in order to be valid in the chain). In addition, since the transactions (or ledgers) are sent to thousands of nodes in a network, it would be virtually impossible to hack thousands of nodes. In short, blockchain is a decentralized and secure form of encrypted accounting.

This unit consists of a video, internet articles and an optional practice demo of a blockchain. You are encouraged to participate in the demo to gain a hands-on understanding of how a blockchain works. You will be required to participate in a discussion on blockchain technology as well as submit a PowerPoint presentation about an introduction to blockchain technology.

Learning Activities

u02s1 - Studies

Readings

Use the Internet to review the following:

- Lucyd. (2017). <u>Lucyd whitepaper.</u> Retrieved from https://icotop.io/wp-content/uploads/2018/01/whitepaper-1.pdf
- Cole, A. (2017). <u>Introduction to blockchain technology.</u> Retrieved from https://www.techopedia.com/an-introduction-to-blockchain-technology/2/32548
- Marr, B. (2017). <u>A complete beginner's guide to blockchain.</u> Retrieved from https://www.forbes.com/sites/bernardmarr/2017/01/24/a-complete-beginners-guide-to-blockchain/

Multimedia

View the following Skillsoft video:

- Campbell, J. (2016). <u>Essentials of blockchain: Introduction to digital currency.</u>
  - Run time: 2 minutes.

Optional Activity

The following Blockchain Hands-On Activity Screen by Anders Brownworth is optional, but highly recommended to experience the technology. The activity screen is your input screen and the video provides the step-by-step instructions for completing the activity. Therefore, it is recommended you have two browser windows open: one for the video, the other for the activity screen. Enjoy!

- Brownworth, A. (n.d.). <u>Blockchain Demo (Video)</u> Retrieved from https://anders.com/blockchain/
- Brownworth, A. (n.d.). <u>Blockchain Hands-On Activity Screen</u>. Retrieved from https://anders.com/blockchain/block.html

u02a1 - Presentation on Blockchain and Cryptocurrencies

Assignment Overview

Your organization (which can be real or fictitious) has asked you to provide a PowerPoint presentation on blockchain technology and cryptocurrency. The workplace can be your own workplace or any other industry of your choice. In your presentation evaluate how this emerging technology meets the needs of the organization.

Assignment Instructions

Create a 10–15 slide PowerPoint presentation that introduces, explains, and provides potential benefits and drawbacks of blockchain and cryptocurrencies. Your presentation should note other uses of blockchain technology outside of cryptocurrency as well as a discussion on one or more of the various digital currencies (Bitcoin, Litecoin, Ethereum or another currency of your choice).

Submit your presentation to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe how blockchain technology meets an identified organizational need.
- Discuss additional uses of blockchain technology beyond cryptocurrency.
- Analyze the various forms of cryptocurrencies (Bitcoin, Litecoin, Ethereum, etc.).
- Justify the selection of an emerging technology based upon an analysis of the technology's capabilities against identified needs.
- Demonstrates professional tone with credible and reliable sources of information about emerging technology.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Media presentation:** Minimum of 10 slides.
- **Resources:** At least three scholarly resources other than the course text or assigned journal articles. Include citations at the end of the presentation.
- **APA guidelines:** Resources and citations are formatted according to current APA style and format. When appropriate, use APA-formatted headings.
- **Font and font size:** 24–28 points for headings and no smaller than 18 points for bullet-point text. For PowerPoint tips, refer to the PowerPoint library guide linked in the Resources.

Course Resources
APA Style and Format
Capella University Library: PowerPoint Presentations

u02d1 - Blockchain and Cryptocurrencies

From your readings in u02s1, you know blockchain technology originates from cryptocurrency. However, blockchain offers other uses beyond the decentralized and secure form of cryptocurrency. For this week's discussion, look for various Internet articles on blockchain and provide an initial post on one of the following topics: the blockchain technology itself, a specific cryptocurrency (i.e. Bitcoin, Litecoin, Ethereum), or other uses of blockchain beyond currency.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's research resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on other uses of blockchain beyond currency described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources
Graduate Discussion Participation Scoring Guide

Unit 3 ≫

Emerging Technology Adoption: Applying the Unified Theory of Acceptance and use of Technology

Introduction

Theory serves as a framework (or a template) for the adoption of technology. There is a vast wealth of research on technology adoption using various theories. The Technology Acceptance Model (TAM) is one of the foundational models for technology adoption. The Unified Theory of Acceptance and Use

of Technology (UTAUT) is often considered "TAM2" because of the addition of more precise constructs that can be used for measuring whether or not an emerging technology would be accepted on a personal or organization-wide basis.

In Unit 3, you will be required to submit a 2–3 page research paper on an emerging technology of your choice and then organize your response on the 4 UTAUT constructs in determining technology acceptance. In addition, this week's discussion topic centers on a comparison and contrast of these two models. Use the study materials from u03s1 (and other sources) for this week's activities.

Learning Activities

u03s1 - Studies

Readings

Use the Capella library to read the following:

- Williams, M.D., Rana, N.P., & Dwivedi, Y.K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review. *Journal of Enterprise Information Management, 28*(3), 443–488.
- Samaradiwakara, G.D.M.N., Gunawardena, C.G. (2014). Comparison of existing technology theories and models to suggest a well improved theory/model. *International Technical Sciences Journal (ITSJ), 1*(1), 21–36.

Use the Internet to review the following:

- Dobinson, C. (2017). How to find and implement emerging technology as a new CIO. Retrieved from https://www.cio.co.uk/cio-career/tips-on-increasing-business-agenda-with-emerging-technology-for-starting-cio-3643008/

u03s1 - Learning Components

- Understands and Applies Theory Constructs

u03a1 - Unified Theory of Acceptance and use of Technology (UTAUT) for Emerging Technologies

Assignment Overview

The UTAUT is a model (or theoretical framework) that suggests 4 key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) to determine technology acceptance. This acceptance of technology can be for a single user or organizational-wide. The technology can be an emerging technology, but it can also be an existing technology.

By examining technology acceptance through the use of these constructs in a "real world" environment, researchers and practitioners can assess an individual's intention to use a specific system, thus allowing for the identification of the key influences on acceptance in any given context. This information can be used to inform the development of an implementation plan for the new technology.

Here are some possible emerging technologies to consider (note: feel free to chose an emerging technology from outside this list.

- Cryptocurrency or blockchain (i.e. Bitcoin, Litecoin).
- FinTech (financial technology).
- Cyber analytics - emerging use of analytics to support cybersecurity.
- Artificial Intelligence/machine learning applications in present and near future use.
- Augmented reality/virtual reality applications.
- Biometric advances.
- Wearable technology.
- Other.

Assignment Instructions

Using the study material provided in u03s1 and other resources, choose an emerging technology and submit a 2–3 paper organized around the 4 constructs:

- Performance Expectancy (technology performance).
- Effort Expectancy (ease of use).
- Social Influence (the degree to which an individual perceives that important others believe he or she should use the new system).
- Facilitating Conditions (the degree an individual believes that an organizational and technical infrastructure exists to support the use of the system).

These constructs may also have sub-categories based on gender, age, experience, and voluntariness of use (Venkatesh et al, 2003).

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Conduct a research activity for selection of an emerging technology.
- Demonstrate knowledge of UTAUT as a theoretical framework for the adoption of an emerging technology.
- Apply the theoretical construct of performance expectancy for emerging technology adoption.
- Apply the theoretical construct of effort expectancy for emerging technology adoption.
- Apply the theoretical construct of social influence for emerging technology adoption.
- Apply the theoretical construct of facilitating conditions for emerging technology adoption.
- Communicate key points in a professional tone in a logical, well-organized manner with credit to external sources that meets the expectations of senior IT leaders.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 2–3 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

[APA Style and Format](#)

u03d1 - UTAUT: A Theoretical Frameworks for Adoption of Emerging Technologies

The UTAUT model is a theoretical framework for adoption of technology. The technology under adoption can be an existing technology or an emerging technology. For example, the Linux operating system has been in use since the early 1990s, but rarely implemented within organizations at the user-desktop level. The UTAUT framework could be used to determine the level of technology

acceptance of this new operating system at an organization. However, for this discussion, we will focus on emerging technologies.

In the Unit 1 discussion, we focused on an emerging technology based on strengths, weaknesses, opportunities, and threats to an organization. For Unit 3, we will choose an emerging technology and organize our discussion on the UTAUT constructs of:

- Performance Expectancy (how well the technology is expected to perform).
- Effort Expectancy (how easy it will be to use the technology).
- Social Influence (the degree to which an individual perceives that supervisors/upper management believe he or she should use the new system).
- Facilitating Conditions (the degree an individual believes that the organizational and technical infrastructure exists to support the use of the system).

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's UTAUT analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the UTAUT analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources
Graduate Discussion Participation Scoring Guide

u03d1 - Learning Components

- Applies Theoretical Framework for Emerging Technology Adoption
- Selects an emerging technology and advocates implementation.
- Writes in a clear, easy-to-read, scholarly tone.

Unit 4 ≫ The Internet of Things (IoT)

Introduction

In Unit 4, we will explore the Internet of Things (IoT). The IoT is made up of devices such as computers, smartphones, speakers, cars, kitchen appliances, cameras, health-related devices, home garage door openers, etc. All these devices can now be connected to the Internet and controlled through a central device.

As more devices join the Internet, considerations will need to be made in terms of IP address availability, bandwidth consumption, and increased workload on network devices (routers, firewalls, switches, etc.). The UTAUT framework is an industry standard model for technology adoption. In this unit, you will perform a basic hands-on lab in Cisco Packet Tracer for an IoT home network and consider the UTAUT constructs that could be used as a basis for technology adoption consideration. In addition, you will write a 1–2 page summary of your lab experience organized on the 4 UTAUT constructs. In addition, through study materials provided in u04s1, you will participate in a discussion thread on any IoT topic of your choice (i.e. protocols, devices, new technologies) using the UTAUT model as a guide for organizing your discussion response.

Learning Activities

u04s1 - Studies

Readings

Use the Internet to review the following:

- Meola, A. (2016). [What is the internet of things?](http://www.businessinsider.com/what-is-the-internet-of-things-definition-2016-8) Retrieved from http://www.businessinsider.com/what-is-the-internet-of-things-definition-2016-8
- Morgan, J. (2014). [A simple explanation of "the internet of things."](https://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/) Retrieved from https://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/

Multimedia

View the following Skillsoft video:

- Sampson, A. (2017). [CompTIA Network+ N10-007: Internet of Things (IoT).](#) Capella Skillsoft Library.
  - Run time: 9 minutes.

In the Capella Skillsoft course collection.

- Calnan, C. (n.d.). [Internet of Things and UI/UX.](#) Skillsoft Capella Library.
  - Study time: 31 minutes.

Capella Media

Click launch presentation to view the video.

- IoT Introduction - Basic Home Setup.
  - Run time: 20 minutes.

Use the following Cisco Packet Tracer File for this unit:

- [IoT Basic Setup Packet Tracer File.](#)

Course Resources
IoT Introduction - Basic Home Setup

u04a1 - IoT Home Device Network: Packet Tracer Activity

Assignment Overview

For the Unit 4 assignment, watch the corresponding video "IoT Introduction - Basic Home Setup" and use Cisco Packet Tracer to complete the Cisco Packet Tracer lab titled "IoT Introduction - Basic Home Setup." To complete this assignment, you must have installed Cisco Packet Tracer. While working on this lab, consider the application of the UTAUT theory. In u04a2, you will write a paper that summarizes your lab experience and reflects upon the four constructs described in UTAUT. Again, UTAUT is a framework for technology adoption; the four constructs to consider are:

- Performance Expectancy (the performance of the technology itself).
- Effort Expectancy (ease of use, to include setup and installation for technicians).
- Social Influence (the degree to which an individual perceives that important others (i.e. supervisors, senior leaders) believe he or she should use or learn the new system.
- Facilitating Conditions (the degree an individual believes that either (or both) an organizational and technical infrastructure exists to support the use of the system).

Assignment Instructions

Complete the step-by-step instructions in the video and upload the completed Packet Tracer assignment under u04a1.

Submit your packet tracer file to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Conduct a lab activity for selection of an emerging technology.
- Determine the necessary facilitating conditions required for an IoT Network (IPv4 Infrastructure).
- Examine performance expectancy (overall technology performance) in creation of a script that turns on a camera when a motion detector is activated.
- Conduct an examination of performance expectancy (overall technology performance) through creation of a registration server.
- Perform final testing and troubleshooting to determine effort expectancy (ease of use).

Course Resources
IoT Basic Setup Packet Tracer File
IoT Introduction - Basic Home Setup	Transcript

u04a2 - Lab Experience Summary: IoT Home Device Network

Assignment Overview

In this assignment you will summarize your experience during the Cisco Packet Tracer Lab titled: "IoT Introduction: Basic Home Setup" in u04a1 to inform the development of an implementation plan. While working on the lab in u04a1, you considered the application of the UTAUT theory. In this assignment for u04a2 you will write a paper that summarizes your lab experience and reflects upon the four constructs described in UTAUT.

Assignment Instructions

Write a 1–2 page summary of your u04a1 lab experience. Organize your response on 4 main points (the 4 UTAUT constructs as follows):

1. Performance Expectancy (the performance of the technology itself).
2. Effort Expectancy (ease of use, to include setup and installation for technicians).
3. Social Influence (the degree to which an individual perceives that important others (i.e. supervisors, senior leaders) believe he or she should use or learn the new system.
4. Facilitating Conditions (the degree an individual believes that either (or both) an organizational and technical infrastructure exists to support the use of the system).

In the conclusion to your paper, describe what are considerations for whether or or not you would be willing to adopt this technology either at home or in the workplace? Complexity? Did the lab help aid in gaining a better understanding of emerging technologies?

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Demonstrate knowledge of UTAUT as a theoretical framework for the adoption of an emerging technology.
- Articulate the theoretical construct of performance expectancy for emerging technology adoption.
- Articulate the theoretical construct of effort expectancy for emerging technology adoption.
- Articulate the theoretical construct of social influence for emerging technology adoption.
- Articulate the theoretical construct of facilitating conditions for emerging technology adoption.
- Demonstrate professional tone in writing with credit to external sources and meeting the expectations of senior IT leaders.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 1–2 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

[APA Style and Format](#)

u04d1 - Internet of Things (IoT)

As with all technologies, the Internet of Things (IoT) requires a platform (operating system) for management and protocols to carry the technology either through a private or public-based network. Various operating systems including Contiki, TinyOS, Embedded Linux, Windows 10 IoT Core, and more are used as platforms for managing IoT devices. In addition, various protocols such as NFC, Z-Wave, ANT, and BlueTooth Smart can be used to carry the technology. For this discussion, post on any IoT device, operating system or protocol of your choice. Organize your response around the 4 UTAUT constructs (performance of the technology, ease of use, social influence, and facilitating conditions).Use the study material provided in u04s1, as well as other sources for your discussion post.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's Internet of Things (IoT) analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the IoT analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

Unit 5 ≫ IPv6 (Next Generation Layer 3 Protocol)

Introduction

IPv6 is slowly but surely becoming our next generation protocol. As a network layer (layer 3) protocol, it is needed for devices to communicate over the Internet. IPv6 was designed to replace IPv4. IPv6 is necessary as IPv4 addresses have reached the point of exhaustion, meaning we are running out of available IPv4 addresses. Your Unit 5 assignment will consist of a Packet Tracer activity to setup an IPv6 network and perform IPv6 routing using Cisco's Enhanced Interior Gateway Protocol (EIGRP).

To successfully complete this unit, you will be expected to:

- Create an IPv6 local area network and perform IPv6 routing.
- Translate IPv6 addresses into binary.
- Abbreviate IPv6 addresses.
- Evaluate the network portion of an IPv6 address.
  Discuss the benefits of IPv6 implementation.

Learning Activities

u05s1 - Studies

Readings

Use the Internet to review the following:

- Hardiman, N. (2013). Breaking down an IPv6 Address: What it all means. Retrieved from https://www.techrepublic.com/blog/data-center/breaking-down-an-ipv6-address-what-it-all-means/
- Kassner, M. (2015). IPv6: The smart person's guide. Retrieved from https://www.techrepublic.com/article/ipv6-the-smart-persons-guide/

Multimedia

In the Skillsoft video collection.

- Lacoste, R. (n.d.). ICND1 3.0: Introducing IPv6. Skillsoft Capella Library.
  - Watch IPv6 Addresses (Part 1).
  - Run time: 6 minutes.

Capella Media

Click launch presentation to view the videos.

- Introduction to IPv6.
    - Run time: 33 minutes.

- IPv6 Network Setup with EIGRP Routing.
    - Run time: 49 minutes.

Use the following Cisco Packet Tracer File for this unit:

- IPv6 with EIGRP Packet Tracer File.

Course Resources
Introduction to IPv6
IPv6 Network Setup with EIGRP Routing

u05a1 - IPv6 Network Setup and EIGRP Routing: Packet Tracer Activity

Assignment Overview

For the Unit 5 assignment, watch the corresponding video "IPv6 Network Setup with EIGRP Routing" and use Cisco Packet Tracer to create a basic IPv6 lab and advertise routes using EIGRP. Before completing this assignment, watch the "Introduction to IPv6" video located in u05s1 for this unit, and read all other material provided in u05a1. In u05a2, you will summarize your lab experience. To prepare for u05a2, while working on this lab, consider your troubleshooting steps, what you have learned about IPv6, how devices can be managed and tested, and the steps you completed to build the IPv6 network.

Assignment Instructions

Follow the step-by-step instructions in the video and upload your completed packet tracer assignment in the course room under u05a1.

Submit your packet tracer file to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Create an IPv6 network and advertise IPv6 routes.
- Test to network to verify connectivity and routing.
- Determine the requirements for implementing the new technology.
- Determine limitations of existing infrastructure and processes to accommodate new technology.
- Define the gaps between the needs of new technology and current infrastructure and processes.
- Identify needed changes to infrastructure and processes for implementation of the new technology.

Course Resources
IPv6 with EIGRP Packet Tracer File
[IPv6 Network Setup with EIGRP Routing](#) | [Transcript](#)

u05a2 - Lab Experience Summary: IPv6 Network Setup and EIGRP Routing

Assignment Overview

In u05a1 you completed the assignment to create a basic IPv6 lab and advertise routes using EIGRP. In this assignment for u05a2 you will summarize your lab experience.

Assignment Instructions

Write a 1–2 page summary of your u05a1 lab experience. Your lab experience can include, but it is not limited to, troubleshooting steps, what you learned about the topic, how devices can be managed and tested, and the specific step-by-step video instructions. What are considerations for whether or or not you would be willing to adopt this technology either at home or in the workplace? Complexity? Did the lab help aid in gaining a better understanding of emerging technologies?

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe the potential of implementing emerging technologies at home or in the workplace.
- Articulate the requirements for implementing the new technology.
- Articulate limitations of existing infrastructure and processes to accommodate new technology.
- Articulate the gaps between the needs of new technology and current infrastructure and processes.
- Articulate needed changes to infrastructure and processes for implementation of the new technology.
- Demonstrates professional tone in writing with credit to external sources that meets the expectations of chief technology officers, IT managers, and other stakeholders.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 1–2 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

[APA Style and Format](#)

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u05d1 - IPv6 - The Next Generation Protocol

Layer 3 addressing is needed for Internet access. Although IPv4 addresses have been exhausted, many organizations still run the 4 octet, 32-bit IPv4 protocol. Network Address Translation (NAT) as

well as Private IPv4 Addressing have delayed the full implementation of IPv6. With that said, most organizations are beginning to run "dual-stack" layer 3 platforms in which both IPv4 and IPv6 run simultaneously on a network. Therefore, IPv4 will not disappear any time soon; however, the continued need for more IP address assignments (i.e. Internet of Things) will require more address space. That is where IPv6 comes in. For this week's discussion, compare and contrast IPv4 to IPv6. In addition, to more addressing space, what are the benefits of IPv6 as compared to IPv4?

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's compare and contrast of IPv4 to IPv6 analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the compare and contrast of IPv4 to IPv6 analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

Unit 6 ≫ Introduction to Biometrics

Introduction

Biometrics have been a practical means of authentication within the banking industry for a few years now. However, the explosion of biometric use is growing exponentially at the work center and even on a personal use level. For example, biometrics can be used for mobile device management (laptops, tablets, phones) at the organization level, and on a personal level, providing better security for the data on our smartphones.

In this unit, you will submit a 2–3 page summary on any biometric topic of your choice and participate in a weekly discussion on biometrics. In addition, you will watch two videos and read two articles regarding biometrics. Finally, you have an optional, fun exercise in installing a biometric app on your phone and using that application to secure access to some (or all) of your apps.

Learning Activities

u06s1 - Studies

Readings

Use the Internet to review the following:

- Kassner, M. (2015). [Biometrics and behavioral tech: The good and the bad security implications.](#) Retrieved from https://www.techrepublic.com/article/biometrics-and-behavioral-tech-the-good-and-the-bad-security-implications/
- Olzak, T. (2007). [Reduce multi-factor authentication costs with behavioral biometrics.](#) Retrieved from https://www.techrepublic.com/article/reduce-multi-factor-authentication-costs-with-behavioral-biometrics/

Multimedia

In the Capella Skillsoft video collection.

- Shannon, M. (n.d.). [Deploying mobile devices securely.](#) Skillsoft Capella Library.
  - Run time: 31 minutes.

In the Capella Skillsoft course collection.

- Shannon, M. (n.d.). [Identify and access management controls.](#) Skillsoft Capella Library.
  - Study time: 29 minutes.

Click the presentation to see the case study.

- Case Study with Biometric Security on School XYZ.

Optional Activity

From your Android or Apple phone, download a free, biometric security app. A free, popular application called "myDevice-Lock" from Neurologix can be installed to your phone. Once installed, select a biometric method of authentication (i.e. fingerprint, signature) and choose which applications (some or all) that require an additional security control before access.

In the Google Play Store or Apple App Store, search for "biometrics neurologix" to find the app.

Course Resources

Case Study with Biometric Security on School XYZ

u06a1 - Advocating the Implementation of Biometrics

Assignment Overview

In this assignment you will select a biometric technology to implement in an organization. For this assignment analyze the challenges of implementing a new technology with existing infrastructures and processes.

Assignment Instructions

From your readings in u06s1 and through other scholarly sources, write a 2–3 paper justifying the implementation of one or more biometric technology for your organization. Consider authentication, control, and access in your response. The organization may be your current organization, another organization, or a fictitious organization.

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Justify the use of biometric technology with support for implementation.
- Organize response by authentication, control, and access.
- Determine the requirements for implementing the new technology.
- Determine limitations of existing infrastructure and processes to accommodate new technology.
- Define the gaps between needs of new technology and current infrastructure and processes.
- Identify needed changes to infrastructure and processes for implementation of the new technology.
- Present technical concepts in a manner easily understood by non-technical stakeholders in writing with credit to external sources.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 2–3 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

[APA Style and Format](#)

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u06d1 - Organizational use of Biometric Technology

From your readings in u06s1, discuss a current, planned, or potential use of biometrics within your organization. How is biometrics being used or could be used for authentication, control, and access? Your discussions can be wide-ranging, covering topics including physical security (cameras, badges, physical access, locked doors, etc), equipment control, and access to software. Your discussions could be based on a fictitious organization (i.e. a small start-up, medium-sized business). You may use reading material outside u06s1 to support your topic.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's biometrics analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the biometrics analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

Unit 7 ≫ Emerging Network Technologies and Threats

Introduction

In spite of our advances in networking technologies, networks are still slow to converge after catastrophic events (i.e. most recently, Hurricane Harvey). New layer 3 and 4 protocols are being developed to greatly reduce browser page loads as well as to reduce network convergence times. In addition, new emerging threats are occurring at an alarming rate. This unit focuses on an understanding of new technologies and protocols being developed, a review of emerging threats to the network, and finally, using a "going back to basics" approach to securing a network.

The goals and objectives of this unit are:

1. Gain an understanding of new, emerging networking technologies.
2. Review new, emerging threats to the network.
3. Participate in a discussion thread on these technologies and threats.
4. Submit a PowerPoint presentation on an emerging technology or emerging threat of your choice.
5. Complete a "hands-on" activity to secure a local area network against emerging threats.

Learning Activities

u07s1 - Studies

Readings

Use the Internet to review the following:

- Bureau, S. (2017). RIT team creates high-speed internet lane for emergency situations.. Retrieved from https://www.rit.edu/news/story.php?id=61939
- Chertoff, M. (n.d.). Over the horizon: Emerging security threats and risks to the enterprise. Retrieved from https://www.securitymagazine.com/articles/88352-over-the-horizon-emerging-

security-threats-and-risks-to-the-enterprise

- Egan, G. (2017). Five tips from CISOs for managing emerging cybersecurity threats. Retrieved from https://info.wombatsecurity.com/blog/five-tips-from-cisos-for-managing-emerging-cybersecurity-threats
- Kassner, M. (2017). Why bandwidth bottlenecks during disasters may require a new routing protocol. Retrieved from https://www.techrepublic.com/article/why-bandwidth-bottlenecks-during-disasters-may-require-a-new-routing-protocol/
- Patterson, D. (2016). Experts predict 2017's biggest cybersecurity threats. Retrieved from https://www.techrepublic.com/article/experts-predict-2017s-biggest-cybersecurity-threats/
- Protalinski, E. (2015). Google plans to propose its QUIC network protocol, which delivers HTTP over UDP, as an Internet standard. Retrieved from https://venturebeat.com/2015/04/17/google-plans-to-propose-its-quic-network-protocol-which-delivers-http-over-udp-as-an-internet-standard/
- Rubens, P. (2013). 6 Emerging security threats, and how to fight them. Retrieved from https://www.esecurityplanet.com/network-security/6-emerging-security-threats-and-how-to-fight-them.html

Optional Readings

- Hardesty, L. (2017). Testing new networking protocols. Retrieved from http://news.mit.edu/2017/speed-testing-traffic-management-data-center-networks-0321

Capella Media

Click launch presentation to view the video.

- Going Back to Basics - Securing the Network Against Emerging Threats.
  - Run time: 51 minutes.

Use the following Cisco Packet Tracer File for this unit:

- Network Security Packet Tracer File.

Course Resources
Going Back to Basics - Securing the Network Against Emerging Threats

u07a1 - Packet Tracer Activity: Going Back to Basics - Securing the Network Against Emerging Threats

Assignment Overview

For u07a1, watch the corresponding video and complete the Cisco Packet Tracer lab: "Going Back to Basics - Securing the Network Against Emerging Threats." This is a "follow along" step-by-step instructional video that will reinforce foundational principles that are still paramount to protect your network against modern threats. In u07a2, you will summarize your lab experience. To prepare for u07a2, while working on this lab, consider your troubleshooting steps, what you have learned about IPv6, how devices can be managed and tested, and the step you completed to secure a network.

Assignment Instructions

Follow the step-by-step instructions in the video and upload your completed Packet Tracer assignment in the course room under u07a1.

Submit your Packet Tracer file to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Configures and test Secure Shell (SSH) for Remote Access.
- Create and apply an access control list for Remote Access.
- Configure and verify the operation of port security.
- Shut down all unused ports.

Course Resources
Network Security Packet Tracer File
[Going Back to Basics - Securing the Network Against Emerging Threats](#)	[Transcript](#)

u07a2 - Lab Experience Summary: Going Back to Basics - Securing the Network Against Emerging Threats

Assignment Overview

In u07a1 you completed the assignment to set up a network security lab. In this assignment for u07a2 you will summarize your lab experience.

Assignment Instructions

Write a 1–2 page summary of your u07a1 lab experience. Your lab experience can include, but it is not limited to, troubleshooting steps, what you learned about the topic, how devices can be managed and tested, and the specific step-by-step video instructions. What are considerations for whether or or not you would be willing to adopt these security approaches either at home or in the workplace? Complexity? Did the lab help aid in gaining a better understanding of emerging technologies?

Submit your paper to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe the potential of implementing emerging technologies at home or in the workplace.
- Articulate the requirements for implementing the new technology.
- Articulate limitations of existing infrastructure and processes to accommodate new technology.
- Articulate the gaps between needs of new technology and current infrastructure and processes.
- Articulate needed changes to infrastructure and processes for implementation of the new technology.
- Demonstrate professional tone in writing with credit to external sources and meeting the expectations of chief technology officers, IT managers, and other stakeholders.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Paper length:** Minimum of 1–2 pages, not including the reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

Course Resources

APA Style and Format

u07d1 - Emerging Network Technologies: An Open Discussion

Using the material provided in u07s1 and other sources, discuss an emerging network technology of your choice. Your topic choice could perhaps be a layer 2, 3, 4, or 7 (application layer) technology used to enhance local and wide area network operation, to include more stringent network security. The technology can be enterprise wide or local.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's emerging network technology analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the emerging network technology analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources
Graduate Discussion Participation Scoring Guide

Unit 8 ≫ Artificial Intelligence

Introduction

From voice-activated assistants like Siri and Cortana to personalized movie suggestions on Hulu and Netflix, artificial intelligence (AI) is becoming more prevalent in our everyday activities. This unit provides an in-depth analysis of various forms of AI that exist across all economic sectors. In

addition, this unit encompasses some fun-filled AI activities you can conduct on your PC and on your phone.

The goals of this unit are:

1. Review various forms of AI implemented across all economic sectors.
2. Explore AI activities on your laptop or phone.
3. Participate in a discussion on one or more of your AI activities.
4. Submit a PowerPoint presentation on any AI topic of your choice.

Learning Activities

u08s1 - Studies

Readings

Use the Internet to review the following:

- Google Creative Lab. (n.d.). Teachable machine. Retrieved from https://experiments.withgoogle.com/ai/teachable-machine
- Motzenbecker, D. (n.d.). Thing translator. Retrieved from https://experiments.withgoogle.com/ai/thing-translator
- KVSP, R. (n.d.). Form 'n' fun. Retrieved from https://experiments.withgoogle.com/android/form-n-fun
- Rosenbaum, E. & Mann, Y. (n.d.). Giorgio cam. Retrieved from https://experiments.withgoogle.com/ai/giorgio-cam
- Crawford, K. (2017). Artificial intelligence with very real biases. Retrieved from https://www.wsj.com/articles/artificial-intelligencewith-very-real-biases-1508252717
- Krauth, O. (2017). The 6 most in-demand AI jobs, and how to get them. Retrieved from https://www.techrepublic.com/article/the-6-most-in-demand-ai-jobs-and-how-to-get-them/
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- Tech Republic. Various Artificial Intelligence Topics. Retrieved from https://www.techrepublic.com/topic/artificial-intelligence/
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- Reese, H. (2016). [Artificial intelligence: The 3 big trends to watch in 2017.](#) Retrieved from https://www.techrepublic.com/article/3-major-ai-trends-to-watch-in-2017/

u08a1 - PowerPoint Presentation on Artificial Intelligence

Assignment Overview

In this assignment you will advocate for an AI topic of your choice.

Assignment Instructions

Create a 10–15 slide PowerPoint presentation about an AI topic of your choice. In your presentation, advocate for its implementation at your place of work (either real or fictitious). Provide an introduction, main points, and conclusion in your presentation. Discuss potential advantages and disadvantages of AI implementation. Consider factors such as cost, savings, impact on jobs, and effectiveness.

Submit your presentation to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet these criteria, please refer to the scoring guide for this assignment.

- Advocate for AI implementation in the workplace.
- Articulate the changes needed to implement the selected technology to both technical and non-technical audiences.
- Articulate the organizational needs that the selected technology will meet and benefits of acquisition in business terms.
- Articulate the organizational needs that the selected technology will meet and benefits of acquisition in technical terms.
- Develop an organized and logically cohesive presentation.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical

thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.

- **Media presentation:** Minimum of 10 slides.
- **Resources:** At least three scholarly resources other than the course text or assigned journal articles. Include citations at the end of the presentation.
- **APA guidelines:** Resources and citations are formatted according to current APA style and format. When appropriate, use APA-formatted headings.
- **Font and font size:** 24–28 points for headings and no smaller than 18 points for bullet-point text. For PowerPoint tips, refer to the PowerPoint library guide linked in the Resources.

Course Resources
[APA Style and Format](#)
[Capella University Library: PowerPoint Presentations](#)

u08d1 - Artificial Intelligence - Browser Enabled Applications

In u08s1, four browser-enabled Artificial Intelligence (AI) applications were provided. Using one of these applications (or another activity of your choice from AI Experiments, another Internet resource, or AI resource currently on your personal computer/smartphone), discuss the application you used. How accurate was it? In what industry do you see any potential benefits (i.e. agricultural, law enforcement, technology, manufacturing, entertainment)?

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's AI application analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the AI application analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

Unit 9 ≫ Wearable Technology

Introduction

So what is wearable technology? Your first thought may be of smartwatches. However, wearable technology includes clothing, eyeglasses, heart and other medical sensors, wraparounds for chronic pain, and prosthetics. For Unit 9, you will explore the topic of wearable technologies and advocate its use within an industry as well as participate in a discussion topic on the subject of your choice.

The goals of this unit are:

1. Submit a 10–15 PowerPoint presentation on a wearable technology; advocate its use in an industry of your choice.
2. Participate in a discussion on any wearable technology of your choice.

Learning Activities

u09s1 - Studies

Readings

Use the Internet to review the following:

- Major, C., Fergusson, R. , & Carr. V., (n.d.). Wearable technology beyond the wrist. Retrieved from https://www.nytimes.com/video/technology/personaltech/100000002753176/wearables-beyond-the-wrist.html
- Maddox, T. (2016). The future of wearables and their role in the workplace. Retrieved from https://www.techrepublic.com/article/the-future-of-wearables-and-their-role-in-the-workplace/
- Maddox, T. (2017). Smart clothing: Slow but steady growth for consumers and the enterprise. Retrieved from https://www.techrepublic.com/article/smart-clothing-slow-but-steady-growth-for-consumers-and-the-enterprise/

- Belluck, P. (2017). First digital pill approved to worries about biomedical 'big brother.' Retrieved from https://www.nytimes.com/2017/11/13/health/digital-pill-fda.html
- Reuter, R. (2017). Wearable technology in the lean enterprise. Retrieved from https://www.youtube.com/watch?v=WqKfdTm3LG8
- Tracy, M. (2017). Technology used to track players' steps, now tracks their sleep, too. Retrieved from https://www.nytimes.com/2017/09/22/sports/ncaafootball/clemson-alabama-wearable-technology.html
- Dow Jones Newswire. (2017). Where wearable tech is headed. Retrieved from http://www.foxbusiness.com/features/2017/10/24/where-wearable-tech-is-headed-wsj.html
- Montalbano, E. (2017). Smart fabric uses magnetic fields to store, transmit data without electronics. Retrieved from https://www.designnews.com/electronics-test/smart-fabric-uses-magnetic-fields-store-transmit-data-without-electronics/104613276457800
- Lee, B. (2017). Wearable technology emerging for chronic pain relief. Retrieved from https://www.forbes.com/sites/brucelee/2017/11/05/wearable-tech-emerging-for-chronic-pain-relief/
- PBSoffbook. (2013). The future of wearable technology. Retrieved from https://www.youtube.com/watch?v=4qFW4zwXzLs
- Sung, D. (2015). What is wearable tech? Everything you need to know explained. Retrieved from https://www.wareable.com/wearable-tech/what-is-wearable-tech-753

u09a1 - PowerPoint Presentation on Wearable Technology

Assignment Overview

In this assignment you will advocate for a wearable technology of your choice.

Assignment Instructions

Create a 10–15 slide PowerPoint presentation that advocates for a wearable technology of your choice in the workplace. The workplace can be your own workplace or any other industry of your choice. In your presentation provide an introduction, main points (that cover both the advantages and disadvantages of procurement/implementation) and an overall conclusion.

Submit your presentation to the assignment area by 11:59 on Sunday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Note advantages and disadvantages of procuring wearable technology in the workplace.
- Advocate for the use of the selected technology with a justification for adopting the technology.
- Articulate the changes needed to implement the new/emerging technology to both technical and non-technical audiences.
- Articulate the organizational needs that the selected technology will meet and benefits of acquisition in business terms.
- Articulate the organizational needs that the selected technology will meet and benefits of acquisition in technical terms.
- Develop an organized and logically cohesive presentation.

Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in education. Original work and critical thinking are required regarding your assessment and scholarly writing. Your writing must be free of errors that detract from the overall message.
- **Media presentation:** Minimum of 10 slides.
- **Resources:** At least three scholarly resources other than the course text or assigned journal articles. Include citations at the end of the presentation.
- **APA guidelines:** Resources and citations are formatted according to current APA style and format. When appropriate, use APA-formatted headings.
- **Font and font size:** 24–28 points for headings and no smaller than 18 points for bullet-point text. For PowerPoint tips, refer to the PowerPoint library guide linked in the Resources.

Course Resources
[APA Style and Format](#)
[Capella University Library: PowerPoint Presentations](#)

u09d1 - Wearable Technologies

As noted in the unit introduction, wearable technologies go beyond fancy Samsung or Apple smartwatches. Applications for wearable technologies are far-reaching, including pharmaceutical, military, law enforcement, sports, medical and data-driven workplaces. For this week's discussion, read the articles and watch the videos from u09s1 and feel free to examine other sources of uses of wearable technology, then provide a wearable technology discussion topic of your choice.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's wearable technologies analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the wearable technologies analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources
Graduate Discussion Participation Scoring Guide

Unit 10 ≫ IPSEC

Introduction

In our final unit, we will explore IPSEC (or IP security). The Internet of Things and IPSEC go hand in hand. As we create a never-ending amount of virtual private networks, they will need to be secured. For example, we certainly would not want our home network with access to everything from our phone to our garage door opener to be hacked while we are away. IPSEC is the solution for new, emerging technologies with layer 2 and layer 3 addresses. The goals of this unit are as follows:

1. Perform a step-by-step video Packet Tracer lab on IPSEC and consider how you would advocate for, and acquire this emerging technology.
2. Participate in a discussion thread on IPSEC.

Learning Activities

u10s1 - Studies

Readings

Use the Internet to review the following:

- Chavez, M. (2014). <u>Understanding IPSEC.</u> Retrieved from https://www.youtube.com/watch?v=Mt_JIQFeU2Q
- Mile2 - Cyber Security Certifications. (2015). <u>How IPSEC Works.</u> Retrieved from https://www.youtube.com/watch?v=doSW8d2iLFM
- René Molenaar. (n.d.). <u>IPsec (Internet Protocol Security).</u> Retrieved from https://networklessons.com/cisco/ccie-routing-switching/ipsec-internet-protocol-security/.
- Balchunas, A. (2007). <u>Overview of IPSEC.</u> Retrieved from http://www.routeralley.com/guides/ipsec_overview.pdf
- Thomas, J. & Elbirt, A. (2004). <u>IPsec: How it works and why we need it.</u> Retrieved from https://www.computerworld.com/article/2561149/security0/ipsec--how-it-works-and-why-we-need-it.html
- Raza, K. (2017). <u>SSL or IPsec: Which is best for IoT network security?</u> Retrieved from https://www.networkworld.com/article/3164531/internet-of-things/ssl-or-ipsec-whats-the-right-approach-for-iot-network-security.html

Capella Media

Click launch presentation to view the video.

- IPSEC Tunneling.
  - Run time: 37 minutes.

Use the following Cisco Packet Tracer File for this unit:

- <u>IPSEC Tunneling Packet Tracer File.</u>

Course Resources
IPSEC Tunneling

u10a1 - Creating an IPSEC Tunnel: Packet Tracer Activity

Assignment Overview

For the Unit 10 assignment, watch the corresponding video and complete the Cisco Packet Tracer lab to create an IPSEC tunnel over a Wide Area network (WAN) link. The Packet Tracer file and the video link can be found in your u10s1 readings. Upon completion, upload your Packet Tracer file in u10a1. While you are completing the lab, consider the complexity of configuring IPSEC and how you would advocate for acquiring this technology with key leaders in your organization.

Assignment Instructions

Follow the step-by-step instructions in the video and upload your completed Packet Tracer assignment in the course room under u10a1.

Submit your packet tracer file to the assignment area by 11:59 on Friday of this week.

Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Configure the basic infrastructure for IPSEC as part of advocating for its implementation.
- Create the cryptographic mapping as part of the acquisition process.
- Create the access control lists for advocating IPSEC permissions.
- Create a set of rules from the transform set to advocate for eventual acquisition of IPSEC.
- Test IPSEC for successful configuration to advocate for acquiring the new technology.

Course Resources
IPSEC Tunneling Packet Tracer File
[IPSEC Tunneling](#)	[Transcript](#)

u10d1 - IPSEC

The introduction of TCP/IP networking from late 1960s through 1980 revolutionized the Internet for government and educational institutions. Eventually, commercial and private entities wanted this "Internet" as well and we experienced an "Internet boom" in the 1990s. TCP/IP changed the direction of technology; however, TCP/IP is not secure. IPSEC (or IP Security) is a protocol that secures Internet communication...encryption, authentication, integrity, and confidentiality. IPSEC is versatile in that it can be implemented in a local area network between a few computers in a classroom; or within a virtual private network tunnel. For example, an IoT device in your home that is "tunneled in" securely to an App on your smartphone. In this discussion, address what IPSEC is, the capabilities, and how IPSEC works and advocate for its use in the workplace.

Your initial discussion post must be submitted by 11:59 PM Thursday.

Response Guidelines

Return to the discussion at the end of the unit to read and review the posts of your peers. Does anyone else's IPSEC analysis resonate with your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response posts, comment on the IPSEC analysis described by a peer.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources
Graduate Discussion Participation Scoring Guide