

Assignment - PSO 5

Purdue CS426 - Computer Security - Prof. Spafford

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Read the following:

- TCP/IP Five Layer Software Model: microchipdeveloper.com/tcpip:tcp-ip-five-layer-model
- Promiscuous Mode: https://en.wikipedia.org/wiki/Promiscuous_mode
- Routing Table: https://en.wikipedia.org/wiki/Routing_table
- Roger Boisjoly: https://en.wikipedia.org/wiki/Roger_Boisjoly
- ACM Code of Ethics: www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct

Problem 1

List the layers of the TCP/IP 5 layer model. In your own words and in a few sentences explain what each layer does. (50 pts.)

- Answer

Problem 2

What does the acronym MAC stand for in terms of the data link layer? How many bytes is a MAC address for Ethernet? How does a network interface and operating system use a MAC address when receiving packets? Describe promiscuous mode with respect to network interface and MAC addresses. (40 pts.)

- Answer

Problem 3

(Based on a Cisco Interview Question) What information does an operating system get back from the system's IP routing table? Before a system can send a packet using the information from the Routing table, it must make a query to the ARP cache. Why is this the case? (20 pts.)

- Answer

Problem 4

Fill in the blanks and explain: An ARP request attempts to resolve a/an _____ to a/an _____. (30 pts.)

- Answer

Problem 5

Describe what happens when an ARP request is spoofed and why an attacker would want to spoof an ARP request. (40 pts.)

- Answer

Problem 6

DNS resolves a/an _____ and returns a/an _____. Why does this need to happen? How do DNS and DNSSEC differ? Why would you want to use DNSSEC? (40 pts.)

- Answer

Problem 7

Explain why this statement is true or false. When using WiFi you do not have to worry about someone eavesdropping because you do not share wires with other machines (20 pts.)

- Answer

Problem 8

Explain why laws and regulations should be a "lower bound" on ethical practices. (20 pts.)

- Answer

Problem 9

Read the articles below and feel free to explore other sources as needed.

- NY Times: <https://www.nytimes.com/2018/03/19/technology/facebook-alex-stamos.html>
- CNN: <https://www.cnn.com/2018/03/20/politics/alexander-nix-cambridge-analytica/index.html>

Briefly describe the situation with Facebook, Russian Election meddling through Facebook, and Cambridge Analytica. Identify at least 3 ethical issues raised here and explain/justify what the ethical action is in the situation. State whether the company or individual took the ethical action you identified and if not, explain why not. (60 pts.)

- Answer

Problem 10

Name 3 companies that generate revenue by using information collected from their users. Explain your answer and explain if you think users are fully aware of how they are a part of the business model. Identify 2 ethical obligations a software developer should have when working inside such a company when it comes to the data of the end users. (60 pts.)

- Answer

Problem 11

As a primer to the lectures on ethics, laws, and regulations watch the documentary on the Challenger Disaster (1.5 hrs)

- <https://www.youtube.com/watch?v=P9LSerNokJk>

- The key companies and governmental agencies involved- The key people involved (20 pts)

- Answer

- The series of events from the first concern of an issue well before the launch, the critical meeting before the launch disaster, and the investigation after the incident (30 pts)

- Answer

- What external pressure was NASA under from the general public and how did it impact their decision making? What external pressure was NASA under when it came to asking funding from the government and how did it impact what they communicated when attempting to secure funding? (40 pts.)

- Answer

- What external pressures were Morton Thiokol employees faced with? (30 pts.)

- Answer

- Use this incident as an example. Describe how communication style plays into effectively convincing supervisors of risks. Will a collaborative communication style always work? Explain. (30 pts.)

- Answer

- Use this incident as an example. Describe how indirectly expressing disappointment as a supervisor or client as NASA did impacts decision making of subordinates/contractors. (30 pts.)

- Answer

- What if anything would you think you would have done differently if you were one of the technical experts in this situation? Explain your answer in at least a paragraph. (30 pts.)

- Answer

- The Challenger Disaster is often used as a case study in several disciplines. Identify 3 possible scenarios that you may encounter as you start out in industry or graduate school where you may be pressured by external factors to ignore technically sound or ethical practices. Describe the situation, sources of external pressure, and how you could see yourself handling the situation. (60 pts.)

- Answer