

CS 531 – Fall 2020

SECURITY IN CYBER-PHYSICAL SYSTEMS

Homework #3

Due: 11/29/2020 11:30PM

Notes: Please cite your sources to answer the following questions. You are welcome to use any figure/text that you find online with providing the source of it.

- 1) Compare and contrast Link Layer (or physical layer) and Network Layer (or IP layer). Provide (1) one data transfer example within link layer and (2) another example with Network Layer with showing all the steps how it works. Make sure your examples are applicable within CPS domain and specify where they can be used. (20p)

Hint: (1) A and B in the same network (local area) and trying to send packets to each other, (2) A and C in different networks trying to send packets to each other.

- 2) Please explain Threat and Vulnerability. What is the relation between them? (15p)
- 3) Find a real CPS incident (attack) example, except Stuxnet. Give the detailed information as how it is started, how it is being transmitted, what were the vulnerabilities it exploited (if any), etc. Then also try to come up with a solution for that attack model. You can also explain the mitigation techniques that is being used for that specific incident. (30p)
- 4) What is VLAN? What are the potential use cases within CPS? (15p)
- 5) Investigate and talk about one of the privacy problems and its solutions in any CPS except the ones we talked in the class. (20p)