

Homework 01

August 26, 2020

Part 1: Definitions

Term	Definition	Example
Dependable	A reliable and secure system	Expected users can perform expected tasks, but nothing else can happen by design
Reliability	We can expect X behavior to be possible	Alice will be able to read this file
Security	We can expect Y behavior to not be possible	A foreign government won't be able to read this file
System	A physical *thing* with more products and people added on top of it	A smartphone running an OS with an owner acting as the user
Subject	A person, physically	Bob
Person	A subject or legal person (i.e. company)	Charlie, Walmart
Secrecy	Limiting the principals with access to information	Classifications such as Top Secret only being accessible to some principal agents
Error	A deviation from expected behavior	Expect the response 200 but get 401
Failure	A system that fails to act in the way it was designed to	A bike not spinning the wheels while pedaling
Reliability	Probability of failure	The chance of your bike breaking
Availability	Probability a system is operational	How often your bike functions as intended
Risk	Probability of an accident	The chance your bike will break
Accident	An unplanned event that results in some loss	The chain falling off during a bike ride
Hazard	Conditions where a failure can lead to an accident	Riding your bike while the chain is ungreased
Critical System	A condition where a failure will result in an accident	A CPU; if it breaks the computer won't function

Part 2: Example — Gas Station

A gas station/convenience store utilizes a number of security features to ensure the safety of personnel and property. The interior of the store houses various kinds of cheap merchandise, employees, and items that require their access be restricted (i.e. tobacco and cash). Outside, customers are responsible for interacting with the gas systems themselves in a system that can be entirely contact-less.

1. Security cameras are installed within and around the store to facilitate security. By placing cameras in open, visible locations, it creates a preventative measure by increasing the risk of unwanted behavior being traced down and punished. Furthermore, it allows for the reporting of crimes, the detection of illegal activity after the fact (such as shoplifting or other theft), and the recovery of stolen goods by providing more information to authorities.
2. Cash registers ensure the security of money within the store in a number of ways. It acts as a form of access control, ensuring that only approved or authorized users can access the cash reserves of the store. It also makes it more difficult to steal cash, a fact that helps to disincentivize a break in which helps increase the safety and security of the personnel and property at the store.
3. Window storefronts help further deter unwanted actions. Since anyone could look into the store and see unwanted behavior happening, the chance of a security breach being reported immediately increases, ensuring that failing all other security measures, a swift response to problems is still possible.
4. Gas shut offs ensure the safety of patrons as well as the safety of property. In the case of a gas spill caused by a pump failing to shut off properly, the supply can still be shut off to prevent further leakage.