

Information Security

Information & Network Security

Classwork 1 - Solutions

David Weston
DCSIS, Birkbeck, University of London

Classwork is *not* marked, but done during the lecture. All classwork and their solutions are also available on-line.

1. Classify each of the following as a violation of *confidentiality*, of *integrity*, or of *availability*:
 - (a) John copies Mary's homework.
 - (b) Paul crashes Linda's system.
 - (c) Carol changes the amount of Angelo's cheque from £100 to £1000.
 - (d) Gina forges Roger's signature on a deed.
 - (e) Rhonda registers the domain name 'AddisonWesley.com' and refuses to let the publishing house buy or use that domain name.

Solution:

- (a) Confidentiality
 - (b) Availability
 - (c) Integrity
 - (d) Integrity
 - (e) Availability
2. For each of the following descriptions decide whether this is a *threat*, an *attack*, or a *vulnerability*.
 - (a) Mallory is hacking into the web server of Company X.
 - (b) Company Y is running an out-of-date version of the Apache web server.
 - (c) Eve has finished programming a new virus.
 - (d) A database connected to the web uses non-validated input to generate SQL queries.

Solution:

- (a) Attack
 - (b) Vulnerability
 - (c) Threat
 - (d) Vulnerability
3. Given an asset value of £1,000,000, an exposure factor of 0.5, and an annualised rate of occurrence of 0.1 (i.e. once every 10 years), compute the Annualised Loss Expectancy.

Solution:

$ALE = SLE \times ARO$, where $SLE = AV \times EF$,
so $ALE = £1,000,000 \times 0.5 \times 0.1 = £50,000$

4. A factory owner wishes to perform a risk assessment for the accidental threats of fire and flood. Should either of these events occur the entire asset, worth £1 million, will be lost. If the rate of occurrence is once in 10 years for flood and once in 20 years for fire, calculate the Annualized Loss Expectancy for each threat.

Solution:

Since we are told the entire asset is lost, we can conclude that the exposure factor in both cases is 1.0.

Single Loss Expectancy (SLE) = Asset Value (AV) x Exposure Factor (EF), so
 $SLE = £1 \text{ million} \times 1.0 = £1 \text{ million}$ for both cases.

From the question we can deduce:

Annualized Rate of Occurrence (ARO) for a flood = 0.1

Annualized Rate of Occurrence (ARO) for a fire = 0.05

Since, Annualized Loss Expectancy (ALE) = SLE x ARO

$ALE \text{ flood} = £1 \text{ million} \times 0.1 = £100,000$

$ALE \text{ fire} = £1 \text{ million} \times 0.05 = £50,000$

5. Which of the following descriptions would you expect to see in a qualitative, quantitative, and hybrid risk assessment approach, respectively?

descriptor set 1	descriptor set 2	descriptor set 3
£1,235,621	high	£1000 - £10,000
£53,600	medium	£10,000 - £100,000
£6769	low	£100,000 - £1,000,000
£43,890,000		£1,000,000 - £10,000,000
£423		

Solution:

set 1: Quantitative

set 2: Qualitative

set 3: Hybrid