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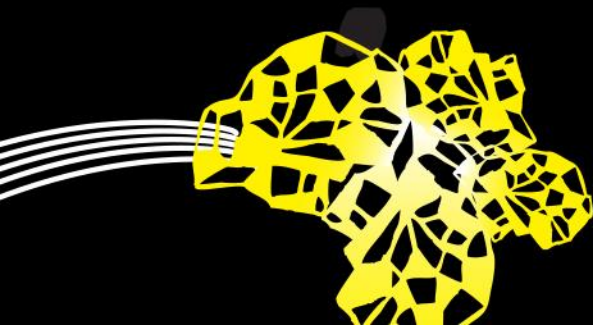
What is security?

Topic of Software Systems (TCS module 2)

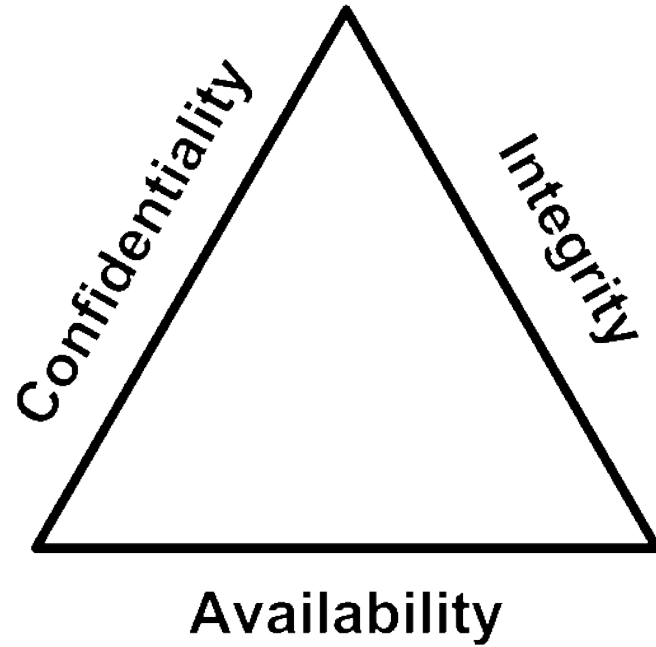Lecturer: Maarten Everts

SECURITY PROPERTIES

Confidentiality

Integrity

Availability

NL, BIV-model:
- Beschikbaarheid
- Integriteit
- Vertrouwelijkheid

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Confidentiality

Integrity

Availability

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CONFIDENTIALITY

Concealment of sensitive information, or:
"The property that information is not made available or disclosed to   unauthorized individuals, entities, or processes." – [RFC 4949]

Examples:
- Users should not be able to see the bank account balance of other users.
- Someone who finds my phone should not be able to see its content.

Typical security measures:
- Encryption [Module 1]
- Authentication [coming up]
- Access control

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CONFIDENTIALITY INCIDENTS

https://www.informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/
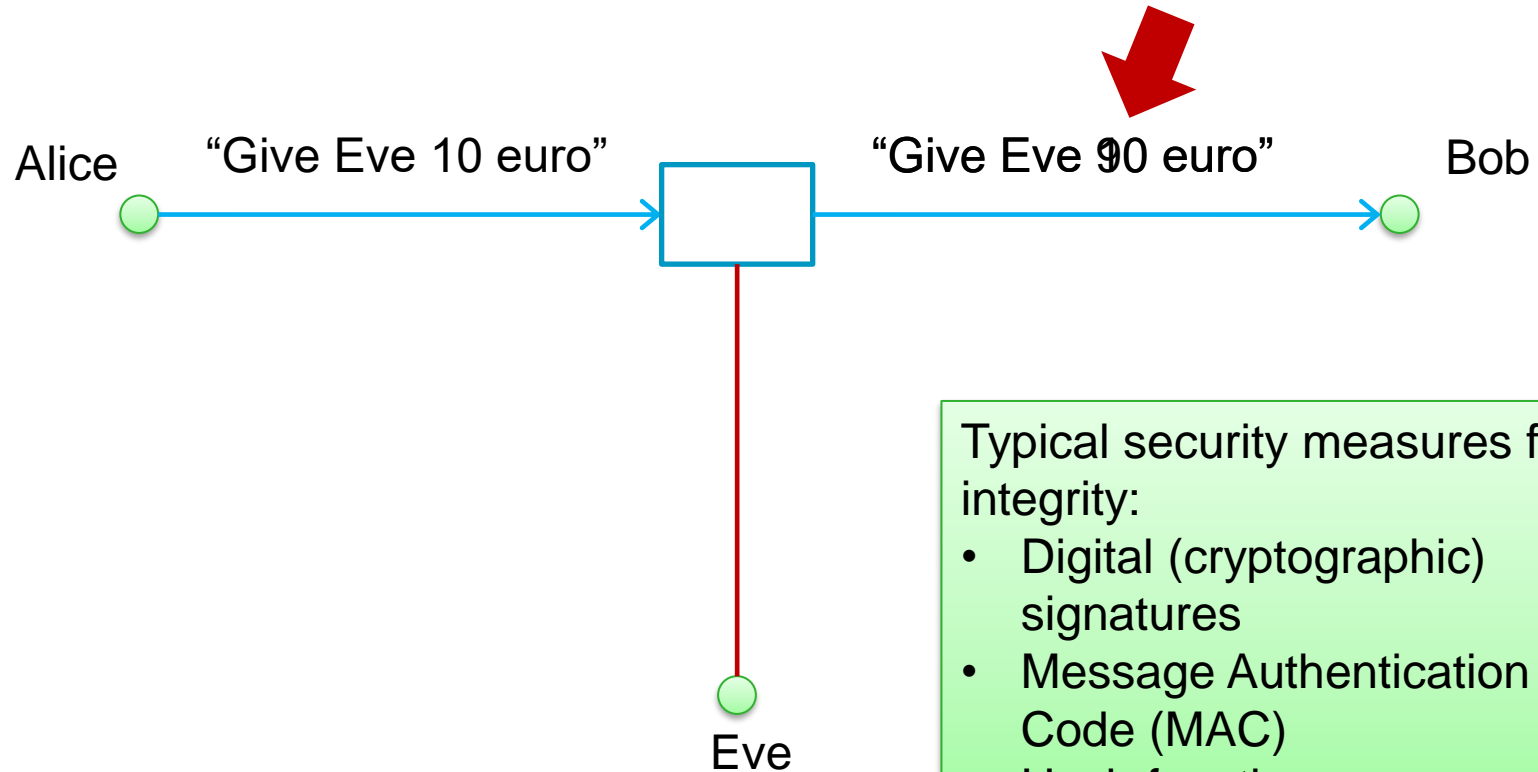
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INTEGRITY

Assuring the accuracy and consistency of data, or:
"The property that data has not been changed, destroyed, or lost in an unauthorized or accidental manner."

INTEGRITY

Alice   "Give Eve 10 euro"   Bob

Eve

INTEGRITY

Alice   "Give Eve 10 euro"   "Give Eve 90 euro"   Bob

Eve

Typical security measures for integrity:
- Digital (cryptographic) signatures
- Message Authentication Code (MAC)
- Hash functions

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INTEGRITY

Other examples of integrity failures:

- Manipulation of bank records
- Manipulation of access logs
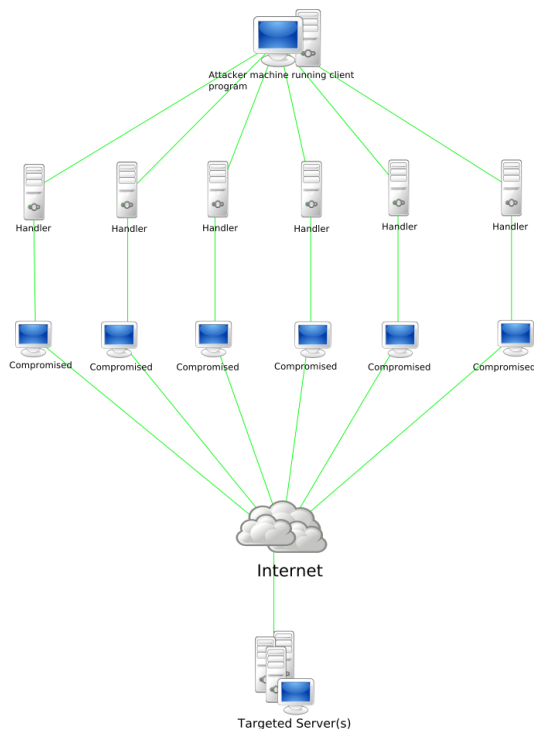- Removal of access logs

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AVAILABILITY

Ability to use the required information or resource.

Availability is the target of denial-of-service attacks: they deny the intended users from accessing a resource.

AVAILABILITY

Common example:
Distributed Denial-of-Service (DDoS)

News
Video
Events
Crunchbase

Message Us

Search

10TH ANNUAL CRUNCHIES AWARDS The Finalists For The Crunchies Have Been Announced | Check Them Out ▶

Shopify

Spotify

Twitter

Popular Posts

Airspace can catch high-speed drones all by itself
5 days ago

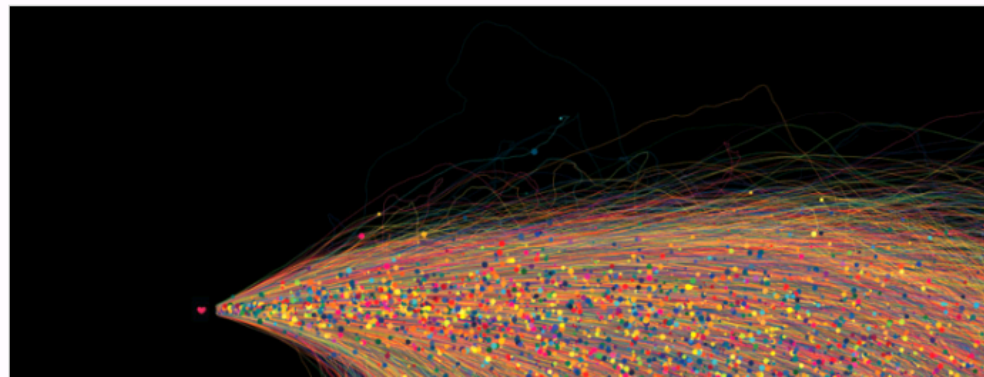App abandomment is on the rise as consumers stick to the apps they know
5 days ago

This 18 year old

Large DDoS attacks cause outages at Twitter, Spotify, and other sites

Posted Oct 21, 2016 by **Darrell Etherington** *(@etherington),* **Kate Conger** *(@kateconger)*

LILY HAY NEWMAN SECURITY 03.01.2018 11:01 AM
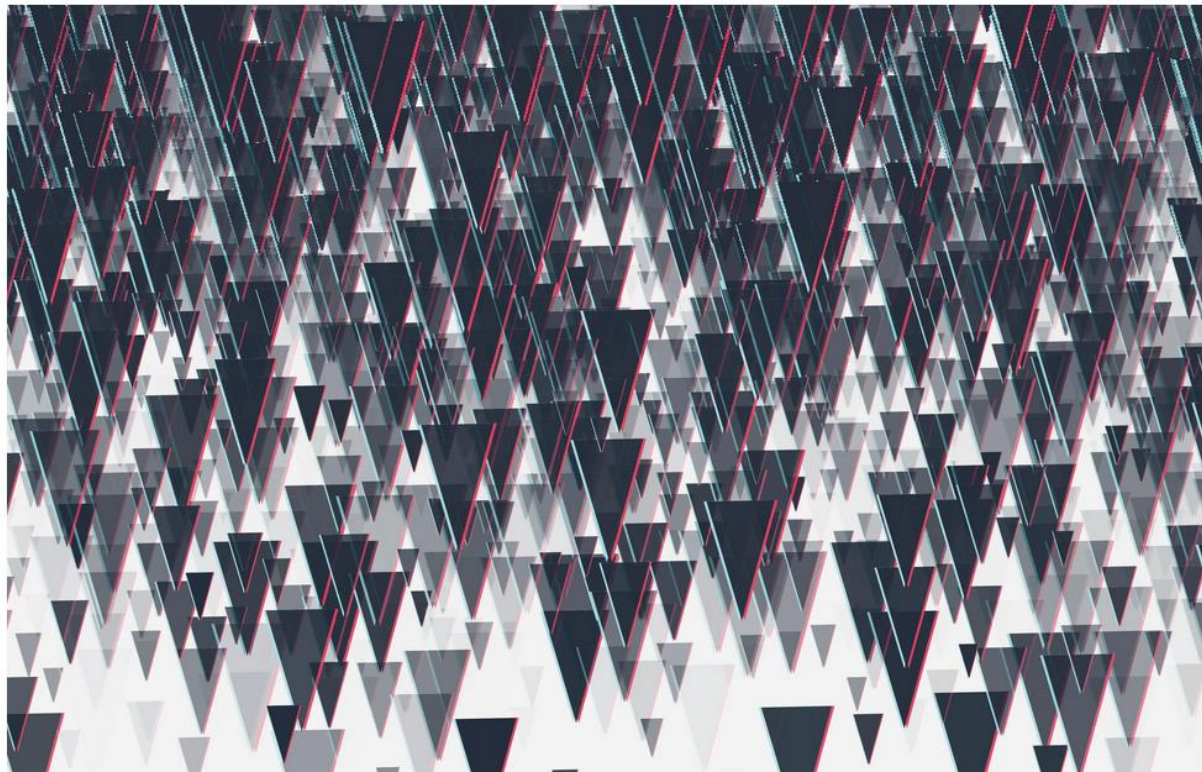
GitHub Survived the Biggest DDoS Attack Ever Recorded

On Wednesday, a 1.3Tbps DDoS attack pummeled GitHub for 15-20 minutes. Here's how it stayed online.

AVAILABILITY

Consider the following code:

```java
public static int badIntLog2(int input) {
    int a = input;
    int i = 0;
    while (a != 1) {
        a = a / 2;
        i = i + 1;
    }
    return i;
}
```

What is the output when input = 8? Or 128?

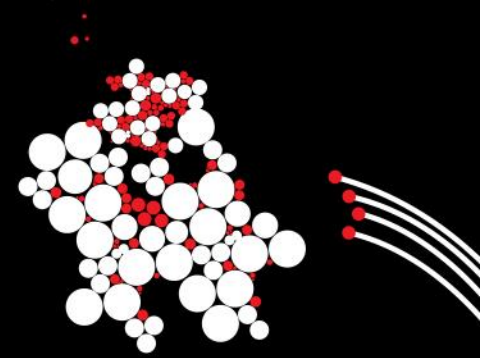What happens if someone is able to make input -8?

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SO, WHAT IS THE THE SECURITY TRIAD?

Confidentiality

Integrity

Availability

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What is security?

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