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CYSE 200

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CIA Triad Write-Up

The confidentiality, integrity, and availability (CIA) Triad is a concept in cybersecurity focusing on data protection. At its core it is a way to guide the creation of information security policies (Chai). While the CIA triad is normally looked at as something affected by bad actors, sometimes benign user action can also compromise part of the CIA triad.

Points of the CIA Triad

Confidentiality refers to keeping data private and preventing unauthorized users from having that data. To reach this goal, access control to sensitive data must be implemented so that information is not improperly shared. One way that confidentiality can be compromised is a user's account at Coca-Cola uses a weak password that is compromised, and the secret recipe for Coke is leaked online.

Integrity refers to making sure data can be trusted and hasn't been changed. Companies can ensure that data is trustworthy and accurate with hashing, signatures, and certificates that prove the reliability of data. Integrity can be compromised by an attacker breaching a bank's network and maliciously changing account balances or deleting system logs.

Availability is ensuring that data can be accessed by the people who need it. If data is secure and accurate, but inaccessible, what use does the data serve to anybody? Data can be kept available by using backups and having redundant hardware to keep services online. Availability can be compromised by high volumes of user traffic to servers. A recent example is the release of Hollow Knight: Silksong on September 4th where so many users purchasing and downloading the game crashed servers for Steam, Nintendo eShop, the Microsoft Store, and the PlayStation Store for multiple hours.

Authentication vs Authorization

Authentication is verifying the identity of a user. For a user to authenticate themselves, information like a password or pin number is provided, sometimes with a temporary code from a mobile app for multi-factor authentication.

Authorization is granting access to information or a physical place to a user. A user cannot authorize themselves to open a door or access a computer, they are authorized administratively which is checked before access is granted or denied.

References

Chai, W. (2022). *What is the CIA Triad? Definition, Explanation, Examples*. Retrieved from <https://www.techtarget.com/whatis/definition/Confidentiality-integrity-and-availability-CIA?jr=on>

Fortinet. (n.d.). *Authentication vs Authorization: Key Differences*. Retrieved from Fortinet: <https://www.fortinet.com/resources/cyberglossary/authentication-vs-authorization>

Fortinet. (n.d.). *CIA Triad*. Retrieved from Fortinet: <https://www.fortinet.com/resources/cyberglossary/cia-triad>