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CYSE 200T

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Understanding the meaning and Importance of the CIA Triad

In this brief report, I will be discussing the three structural components of the CIA Triad and why they are important key concepts of modern cybersecurity. I will also discuss the key differences in the terms “authentication” and “authorization”.

Background

As an information security model, the CIA triad guides an organizations effort to improve its security program. The CIA, or AIC, is comprised of three foundational principles: confidentiality, integrity, and availability. These principles should be the looked at first when implementing new technologies to safeguard assets. Often when a security incident occurs, it is often due to one of the principles being violated.

Confidentiality

Confidentiality can be described as making sure only authorized personnel have access to view and modify data. When handling or collecting sensitive information about either the user or the employee, making sure that the user/employee only has access to his/her confidential information. To prevent confidentiality being transferred to the wrong person, standards and practices must be followed to ensure the safety of confidential information. There are many different options of securing information including Username/password, 2FA, etc.

Integrity

Integrity of data is considered the data being maintained as to not be modified or deleted by anyone other than the authorized user. This means that an information system with low integrity can have information be modified by third party sources. To ensure the proper integrity of an information system, backups of the information must be kept to correct any files that may have been deleted or changed. Strategies against this include encryption, hashing, and digital certificates can all help with informational integrity by providing evidence that the file is in the correct and proper state.

Availability

The availability of an information system refers to the level of availability the user has to access their information. The user should be able to access the information whenever required, therefore, system maintenance must be planned accordingly as to affect the users in the least possible way. Not allowing the users to access their information when required can cause the system to lose its value (Intelliplate). Situations can vary from natural disaster to a DDoS attack to prevent users from accessing the required information. Redundancy and hardware tolerance are both methods to help ensure the availability of information.

Authorization and Authentication

The process of authentication and the action of authorization go hand and hand. Authorization is considered “the act of granting an authenticated party permission to do something.” (Microsoft) Authorization also defines what data the user allowed to access and/or modify. Microsoft also defines authentication as “the process of proving that you are who you say you are.” This means that in order to be authorized to access some form of information you must be authenticated to prove you are who you say you are. A good example of this is the ODU

2-factor authentication. When signing into an ODU student/faculty account, the user must be authorized to view the information associated with that account. To do this ODU sends an authentication notification to the user's device where they agree to the prompt. This then authenticates themselves as being affiliated with ODU and are now authorized to access their information.

Conclusion

The CIA triad is a set of foundational principles for a secure information system within an organization. Without the proper implementation of these principles, it can be believed that the information system is faulty and has no value. These principles should be used whenever approaching new ideas or technologies to ensure the safety of an organization's assets.

References

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