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The CIA triad and Authtentication&Authorization

CIA is a guiding model in IT and cybersecurity. The abbreviation stands for Confidentiality, Integrity and Availability. It is mainly used to guide policies for information security withing a business organization and since the introducing of the term back in the 1970s, it has been fundamental in the field. Not only it is used to protect critical information but also it ensures the reliability and availability of the systems and programs in the organization. Good examples of CIA triads are ATMs, online banking systems and E-commerce websites. Now let's break it all down.

Confidentiality

Confidentiality or privacy in some cases, ensures that vital information is only accessible by authorized users or admins (sometimes with user's permission). Sensitive information should be always well protected. There is always a risk when data is transmitted. Encryption standards should be high as monetary losses and sensitive

personal information can be costly for the organization and its clients. Nowadays companies are using two-factor authentication(2FA) for gaining access. That can be answering a private question, receiving a text or email with a verification code or using a second party application. For data transmission, some are using a VPN for extra protection.

Integrity

Integrity is remaining consistency with the data while it is transmitting. Data cannot be altered by unauthorized people if it corrupted then the integrity is lost. Malware and Ransomware are popular risks for integrity, together with Data tempering. Backup systems, data checksums and digital signatures are key into preventing and dealing with breaches and cyber-attacks. Hash functions are also used to check If our data is modified.

Availability

All data and information should be readily available for the clients at any given time. All systems should be running smoothly and up to date. Some bigger companies even have electric generators to keep servers on when power is down, of course assuming the internet connection is still up. Bottlenecks or server slowdowns should also be prevented by making sure all computers and hardware are in a good condition. For example, server overheating can cause some of those problems. “Fast and adaptive disaster recovery is essential for the worst-case scenarios…” (Chai,202)

Authentication and Authorization

“Authentication and Authorization are essential parts of basic security processes and are solely needed in the Internet of Things” (Kim,2023). Authorization is the process of figuring out if an entity can access resources. Authorization can also include denying or revoking access when user’s information is not verified. After verifying you will be able to access some information. A great example is login into your back account so you can check your balance. On the other side Authentication is the process of proving that the account holder and the users are the same person or at least someone that is authorized to use the account. Most cases Authorization is not possible without Authentication. We can’t just give access to someone that we cannot verify hist identity. For example, you log in into your bank account with id and password, maybe you even get a text with a verification code. The bank confirms it is you and now not only you can check your balance but also transfer money.

Conclusion

CIA triad is a vital model in the information security. It is the foundation of cyber security and providing a structure for risk management. It also needs some updates, addressing better emerging technologies and the complex threat landscape. Authorization and Authentication remain important processes for granting and denying access and verifying information. Both processes are intertwined.

References

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