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SCHOOL OF INFORMATION AND TECHNOLOGY

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SYSADM1 – Kerberos Basics

Research Activity

1. What is Kerberos, and why is it used?
 - Kerberos is a network protocol developed for authenticating service requests between two or more trusted hosts across an untrusted network. It uses secret-key cryptography and a trusted third-party that is Key Distribution Center (KDC) for the authentication of service requests or client-server applications and verify user identities. It is widely used since it provides a robust and trusted framework for authentication.
2. What are the main components of Kerberos?
 - Authentication Server (AS)
 - Database
 - Ticket Granting Server (TGS)
 - Key Distribution Center (KDC)
3. What is a "ticket" in Kerberos, and why is it important?
 - Ticket in Kerberos refers to the encrypted message or credentials that provides evidence that can be used to verify your identity when trying to access a service. It is important as it is used in the
4. What is a Kerberos "realm," and what is its purpose?
 - Refers to the network domain which Kerberos resides or where it operates. Kerberos realms purpose is to organize and manage authentication within specific network domains, providing scalability, security, and administrative control.
5. How does Kerberos authenticate a user?
 - User Login: The user logs in by providing their credentials (username and password) to the Authentication Service (AS).
 - Ticket Granting Ticket (TGT): The AS verifies the credentials and issues a TGT, which is encrypted using the user's password.
 - Service Request: To access a specific service, the user presents the TGT to the Ticket Granting Service (TGS).
 - Service Ticket: The TGS verifies the TGT, and if valid, issues a Service Ticket for the requested service.
 - Access Granted: The user presents the Service Ticket to the desired service, which verifies the ticket and grants access if it's valid.

6. What does each component (KDC, TGS, AS) contribute to the authentication process?
 - The Key Distribution Center acts as the main organization responsible for ticket issuance. It combines the functions of the Ticket Granting Service with the Authentication Service.
 - The Authentication Service is in charge of confirming their credentials. The user receives a Ticket Granting Ticket (TGT) from the AS if it is successful.
 - The Ticket Granting Service issues a Service Ticket for the desired service after a user presents their TGT to it in order to gain access to a service.
7. How does a ticket improve security compared to repeated password logins?
 - Ticket improves security by minimizing the need for repeated password logins thus limiting password exposure using encryption, providing replay protection, supporting mutual authentication, and enabling Single Sign-On.