

Authorization:- Authorization is the culmination of the administrative policies of organization expressed as a set of rules that can be used to determine which user has what type of access of which portion of the database. The person who is in the charge of specifying the authorization is usually called authorizer. Authorizer can be distinct from a database administrator the DBA.

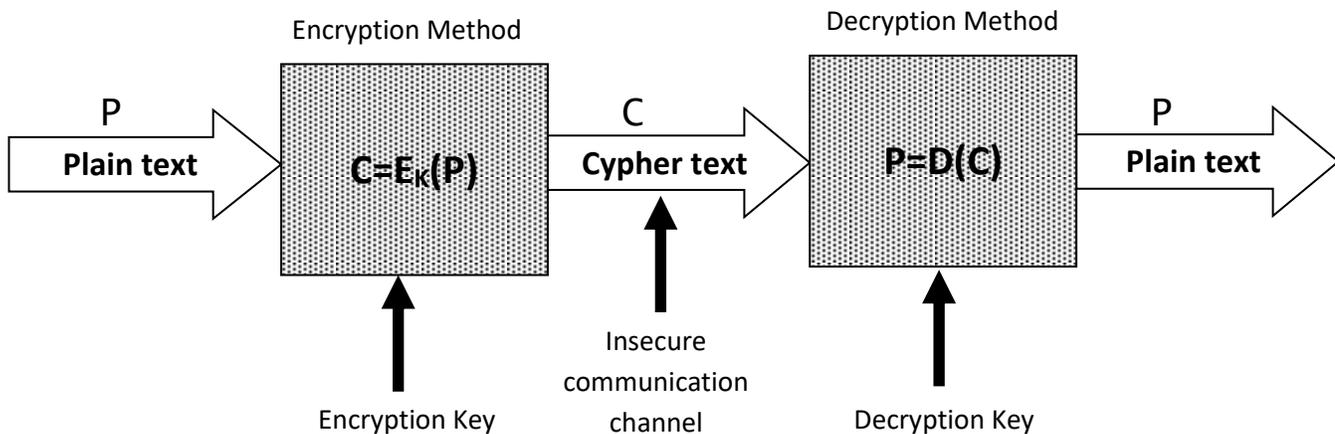
The authorization is usually maintained in the form of a table called access matrix.

Identification and authentication:- The authorization mechanism prepares the user profile for a user and indicates the portion of the database accessible to the user and the mode of access allowed. But the security policies in the database system require that the system knows the identity of the user making the request. This requires that before making request the user has to be identified herself or himself to the system and authenticate the identification to confirm that the user is in fact the correct person. A number of methods can be used in the authentication (1) by something known only by the user like password (2) by something that only the user possesses like encoded badge card etc. (3) by some physical psychological characteristics of the user. like fingerprint.

Encryption decryption

Cryptography:- One way to strengthen and security in computer systems is to encrypt sensitive records and message in transit and in storage. The original un-enciphered text is called the plain text or the clear text. It can be encrypted using some encryption method parameterized by key, the result is called ciphered text. The cipher text may be stored or transmitted via the communication, such as wire and radio links or more traditionally traditional by a messenger. Plain text may be obtained by decrypting the ciphered message using decryption key.

A cryptography system that uses the same key for encryption and decryption is called symmetric. In asymmetric schemes, different keys are used at the two ends.



Integrity rules :- The relational model includes two general integrity rules. These integrity rules implicitly or explicitly define the set of consistent database States or changes of states or both.

Integrity rule 1 (Entity integrity) :- If attribute A of a relation R(R), is a prime attribute of R(R), then A cannot accept null value.

Integrity rule 2 (Referential integrity) :- [Integrity rule 2 is concerned with the foreign keys i.e. with attributes of a relation having domains that are those of the primary key of another relation.]

In given to relations R and S suppose R refers to the relation S via a set of attributes that forms the primary key of S and this set of attributes from a foreign key in R. Then the values of foreign key in a tuple in R must either be equal to the primary key of the tuple of S or be entirely null.

Auditing:- Auditing is relevant in the database environment to verify the automated operations are properly implemented and

executed since data entry and maintenance is done online the history of the evolution of a piece of data is no longer available in the database which will contain the latest value only. In traditional system where evolution of data object is preserved in the form of records on paper. Computing system can be used by crafty fraud artists to permanently destroy the evidence of their mischievous deeds. So the secure audit trails becomes all the necessary in the database environment.

Database recovery

Recovery scheme can be classified as forward or backward recovery. Database systems uses the latter schemes to recover from error.

Forward error recovery :- In this scheme when a particular error in the system is detected the recovery system makes an accurate assessment of the state of the system and then makes appropriate adjustments based on the anticipated result had the system been error free. The adjustments obviously depend on the error consequently the error types to be anticipated by the designers of the recovery system. The aim of the adjustment is to restore the system so that the effects of the error are cancelled and the system can continue to operate. This scheme is not applicable to unanticipated errors.

Backward error recovery:- In this scheme the system is reset to some previous correct state that is known to be free of any errors. The backward error recovery is a simulated reversal of time and does not try to anticipate the possible future state of a system.

Distributed database system:- A distributed database system consists of a collection of sites, each of which maintains a local database system each site is able to process local transactions, those transactions that access data only in that single site. A site may participate in the execution of global

transactions, that access data in several sites the execution of global transactions require communications among the sites.

In a distributed database system the database is stored on several computers. The computers in distributed system communicate with each other through various communication media such a high speed buses or telephone line.

Advantage of data distribution:-