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Practice the principle of least privilege. Oracle recommends the following guidelines: Grant privileges needed only. Do not provide database or role users with more privileges than they need. (If possible, give privileges to roles, not users.) In other words, the principle of less privilege is that users are given only those privileges that are actually needed to perform their job effectively. To implement this principle, limit as much as possible the following: The number of SYSTEM and OBJECT privileges granted to database users. The number of people who are allowed to make SYS-privileged connections to the database. The number of users who have obtained ANY privileges, such as DROP ANY TABLE privilege. For example, you don't need to grant CREATE ANY TABLE privileges to a non-DBA-privileged user. The number of users who are allowed to perform actions that create, modify, or release database objects, such as statements of TRUNCATE TABLE, DELETE TABLE, DROP TABLE and so on. Limit the grant of CREATE ANY EDITION and DROP ANY EDITION privileges. To maintain additional versions of objects, edits can increase the consumption of resources and disk space in the database. Allow only CREATE ANY EDITION and DROP SOME EDITION privileges to trusted users who are responsible for executing updates. Limit the CREATE ANY JOB, BECOME USER, EXP_FULL_DATABASE, and IMP_FULL_DATABASE privileges. These are powerful security privileges. Allow these privileges only to users who need them. Limit library privileges to trusted users. The CREATE LIBRARY, CREATE ANY LIBRARY, ALTER ANY LIBRARY, and EXECUTE TO ANY LIBRARY Privileges, and the EXECUTE ON library_name grants convey a great deal of power to users. If you plan to create PL/SQL interfaces to libraries, only grant EXECUTE privilege to the PL/SQL interface. Do not grant EXECUTE to the underlying library. You must have EXECUTE privilege on a library to create the PL/SQL interface to it. However, users have this privilege implicitly over the libraries they create in their schemes. Explicit EXECUTE ON library_name bags are rarely required. Just make an explicit concession of these privileges to trusted users, and never to the PUBLIC role. Limit synonym privileges to trusted users only. The privileges of the CREATE PUBLIC SYNONYM and DROP PUBLIC SYNONYM system transmit a great deal of power to these users. Do not grant these privileges to users unless they are trusted. Do not allow non-administrative users to access SYS schema property objects. Do not allow users to modify table rows or schema objects in the SYS schema, as this may compromise data. Limit the use of declarations such as DROP TABLE, TRUNCATE TABLE, DELETE, INSERT or similar object modification declarations on SYS objects only to highly privileged administrative users. The SYS schema has the data dictionary. You can protect the data dictionary by setting the the parameter to FALSE. For more information, please refer to Guide 1 under "Data Processing Guidelines." Allow only EXECUTE privilege on DBMS_RANDOM PL/SQL package to trusted users. The EXECUTE privilege on the DBMS_RANDOM package may allow users who normally should have only minimal access to perform the functions associated with this package. Limit permits on full-time facilities. Many Oracles Database products use run-time structures, such as Oracle Java Virtual Machine (OJVM.) Do not assign all permissions to a run-time structure of the database. Instead, grant specific permissions to root document file paths explicit for structures that might run files and packages outside the database. Here is an example of a vulnerable run-time call, which individual files are specified: call dbms_java.grant_permission ('wsmith, SYS:java.io.FilePermission','Ð >ALL FILES>','read;) Here is an example of a better (safer) run-time call specifying a directory path instead: dbms_javamission. Oracle Database installs with several default database user accounts. After a successful database installation, the Database Configuration Assistant automatically blocks and expires most user accounts in the default database. If you perform a manual installation (without using the Database Configuration Assistant) of Oracle Database, the default database users are not blocked on a successful database server installation. Or, if you are upgraded from a previous release of Oracle Database, you may have default accounts from previous versions. Left open in their default states, these user accounts can be exploited, to gain unauthorized access to data or stop database operations. You need to block and expire all user accounts of the default database. Oracle Database provides the SQL statements to perform these operations. For example: ALTER USER ANONYMOUS PASSWORD EXPIRE ACCOUNT LOCK; See Oracle Database SQL Language Reference for more information about the ALTER USER declaration. Installing products and add-ons after the initial installation also involves creating more predefined database accounts. Database Configuration Assistant automatically blocks and expires all additional database user accounts created. Unlock only those accounts that need to be accessed regularly and assign a strong and meaningful password to each of these unlocked accounts. Oracle provides SQL management and passwords to perform these operations. If a default database user account other than the one left open is required for any reason, then a database administrator (DBA) must unlock and activate the account with a new password View Oracle Database Day 2 + Security Guide for a description of the default user accounts that are created when you install Oracle Database. If a default user account of the database, other than the one left is necessary for any reason, then a database administrator (DBA) can unlock and activate the account with a new secure password. Oracle Enterprise Manager Accounts If you install Oracle Enterprise Manager, SYSMAN and DBSNMP accounts are open unless you config Oracle Enterprise Manager for central administration. In this case, the SYSMAN account (if present) will be blocked. If you do not install Oracle Enterprise Manager, only SYS and SYSTEM accounts are open. Database Configuration Assistant blocks and expires all other accounts (including SYSMAN and DBSNMP). Use the following data dictionary views to find information about user access to the database. DBA_* DBA_ROLES DBA_SYS_PRIVS DBA_ROLE_PRIVS DBA_TAB_PRIVS DBA_AUDIT_TRAIL (if the standard auditing is enabled) DBA_FGA_AUDIT_TRAIL (if the end audit is enabled) Monitor the granting of the following privileges only to: users and roles that require such privileges. By default, Oracle Database verifies the following privileges: ALTER SYSTEM AUDIT SYSTEM CREATE A EXTERNAL WORK Oracle recommends that you also check the following privileges: ALL PRIVILEGI (which includes privileges such as DIVENTA UTENTE, CREATE LIBRARY and CREATE PROCEDURE) DBMS_BACKUP The package_RESTORE EXECUTE to DBMS_SYS_SQL SELECT ANY TABLE SELEgiCT on PERFSTAT.STATSTEXT SELECT on PERFSTAT.STATS$_SUMMARY The SYS.USER_HISTORY$ table from all users except SYS and DBA accounts The RESOURCE role from typical app accounts The CONNECT role by users who do not need this role Grant privileges only to roles. The granting of privileges to roles and not to individual users makes it much easier to manage and track privileges. Limit proxy account privileges (for proxy permission) to CREATE SESSION. Use secure application roles to protect the roles enabled by the application code. Secure application roles allow you to define a set of conditions within a PL/SQL package, which determine whether a user can access or not an application. Users should not use a password with secure application roles. Another approach to protecting roles from activation or disabling in an application is the use of role passwords. This approach prevents the user from accessing the database directly in SQL (more than the application) to enable the privileges associated with the role. However, Oracle recommends using secure application roles, instead, to avoid having to manage another set of passwords. Discard users from using the NOLOGGING clause in SQL instructions. In some SQL instructions, the user has the option to specify the clauseindicating that the database operation is not logged in the redo online log file. Even if the user specifies the clause, a repeat record is is is written in the log file to remake online. However, there are no data associated with this record. Because of this, using NOLOGGING has the potential for the malicious code to insert can be accomplished without a control track. The scripts on this page improve content navigation, but do not change content in any way. You can use Oracle Database default features to configure security in the following areas for installing Oracle Database: User account. When creating user accounts, you can protect them in different ways. You can also create password profiles to better protect password policies for your site. Chapter 2, "Managing Security for Oracle Database users", describes how to manage user accounts. Authentication methods. Oracle Database provides different ways to configure authentication for users and database administrators. For example, you can authenticate users at database level, operating system and network. Chapter 3, "Configure Authentication", describes how authentication works in the Oracle Database. Privileges and roles. You can use privileges and roles to limit your access to data. Chapter 4, "Configure Role Privileges and Permissions", describes how to create and manage user privileges and roles. Security of applications. The first step to create a database application is to ensure that it is adequately secure. Chapter 5, "Managing Security for Application Developers", explains how to integrate application security into application security policies. User session information using the context of the application. An application context is a name-value pair that contains session information. You can retrieve session information on a user, such as username or terminal, and restrict access to database and application for that user based on that information. Chapter 6, "Use application contexts to recover user information", describes how to use the context of applications. Access to the row and column level database using Virtual Private Database. A Virtual Private Database policy dynamically incorporates a WHERE predicate into the SQL instructions that the user issues. Chapter 7, "Use Oracle Virtual Private Database toÁ Control Data Access", describes how to create and manage policies for Virtual Private Database. Encryption. You can mask data on the network to prevent unauthorized access to such data. Chapter 8, "Development of applications using data encryption APIs", explains how to use DBMS_CRYPTO and DBMS_SQLHASH PL/SQL packages to encrypt data. Revision of data banks activities You can check database activities in general terms, such as checkingSQL statements, SQL privileges, schema objects, and network activities. Alternatively, you can perform audits in a granular way, for example when using IP addresses outside the corporate network. This chapter also explains how to delete the audit trail from the database. Chapter 9, "Checking Security Access with Audit", describes how to enable and configure the database In addition, Chapter 10, "Keeping the Oracle Database Secure", provides guidelines for making the Oracle Database installation secure.

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