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TDE configuration in oracle 19c Database

Step1- Configure the Wallet Root:

```
SQL> select WRL_PARAMETER, WRL_TYPE, WALLET_TYPE, status from V$ENCRYPTION_WALLET; ==> #<path of default wallet>
```

WRL_TYPE	WALLET_TYPE	STATUS
----------	-------------	--------

/u01/app/oracle/admin/<database_name>/wallet

FILE	AUTOLOGIN	OPEN
------	-----------	------

```
[oracle01 ~]$ mkdir -p /u01/app/oracle/admin/<database_name>/wallet
```

Step: 2- Configure the Wallet Root on the CDB:

ADMINISTER KEY MANAGEMENT CREATE KEYSTORE '/u01/app/oracle/admin/<database_name>/wallet' identified by <password>;

ADMINISTER KEY MANAGEMENT SET KEYSTORE OPEN IDENTIFIED BY <password>;

ADMINISTER KEY MANAGEMENT SET KEY IDENTIFIED BY <password> with backup;

Step: 3- Configure the Wallet Root on the PDB:

ADMINISTER KEY MANAGEMENT SET KEYSTORE open IDENTIFIED BY "<password>";

ADMINISTER KEY MANAGEMENT SET KEY FORCE KEYSTORE IDENTIFIED BY "<password>" WITH BACKUP;

Step: 2- CREATE AUTO LOGIN:

ADMINISTER KEY MANAGEMENT CREATE AUTO_LOGIN KEYSTORE FROM KEYSTORE
'/u01/app/oracle/admin/<database_name>/wallet' IDENTIFIED BY <password>;

ADMINISTER KEY MANAGEMENT SET KEYSTORE CLOSE IDENTIFIED BY <password>;

```
[oracle01 ~]$ ls -ltr /u01/app/oracle/admin/<database_name>/wallet
```

```
-rw----- 1 oracle dba 2555 Nov 28 12:39 ewallet_2024112809392589.p12
```

```
-rw----- 1 oracle dba 3995 Nov 28 12:39 ewallet.p12
```

```
-rw----- 1 oracle dba 4040 Nov 28 12:39 cwallet.sso
```

Step: 3- Online Encryption of Tablespace:

alter session set container=<PDB_name>;

alter system set encrypt_new_tablespaces = 'ALWAYS' scope=both sid='*'; ==> on CDB and PDB

alter tablespace <TABLESPACE_NAME> encryption online encrypt; ==> with default algorithm

OR

ALTER TABLESPACE <TABLESPACE_name> ENCRYPTION ONLINE USING 'AES256' ENCRYPT;

ALTER TABLESPACE <TABLESPACE_name> ENCRYPTION ONLINE USING 'AES256' ENCRYPT;

ALTER TABLESPACE <TABLESPACE_name> ENCRYPTION ONLINE USING 'AES256' ENCRYPT;

ALTER TABLESPACE <TABLESPACE_name> ENCRYPTION ONLINE USING 'AES256' ENCRYPT;

Step: 4- Rebuild index:

If there is stale indexes #<stale index>

```
SQL> select * from all_ind_statistics
```

```
where stale_stats = 'YES' and owner in (select USERNAME from dba_users where ORACLE_MAINTAINED != 'Y');
```

```
alter index <index_name> rebuild online parallel 10;
```

```
alter index <index_name> rebuild online parallel 10;
```

```
alter index <index_name> rebuild online parallel 10;
```

```
alter index <index_name> rebuild online parallel 10;
```

```
alter index <index_name> rebuild online parallel 10;
```

Step: 4- TABLESPACE ENCRYPTED:

```
select TABLESPACE_NAME, ENCRYPTED from dba_tablespaces where ENCRYPTED='YES';
```

Noted:

-Key Management Complexity – Losing the encryption key can result in permanent data loss.

-Not a Complete Security Solution – TDE does not prevent SQL injection, unauthorized access, or insider threats.