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Database Security: ¿Cómo identificar áreas de riesgo y vulnerabilidades de seguridad? Mitíguelos

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¿Continuidad?

¿Moda?

¿Necesidad?

¿Cumplimiento?

¿CyberSeguridad?

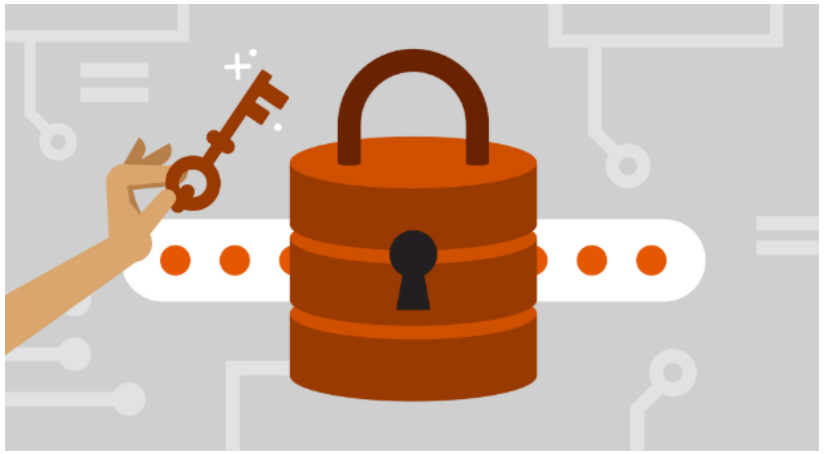
¿Transformación Digital?

¿Qué opina?

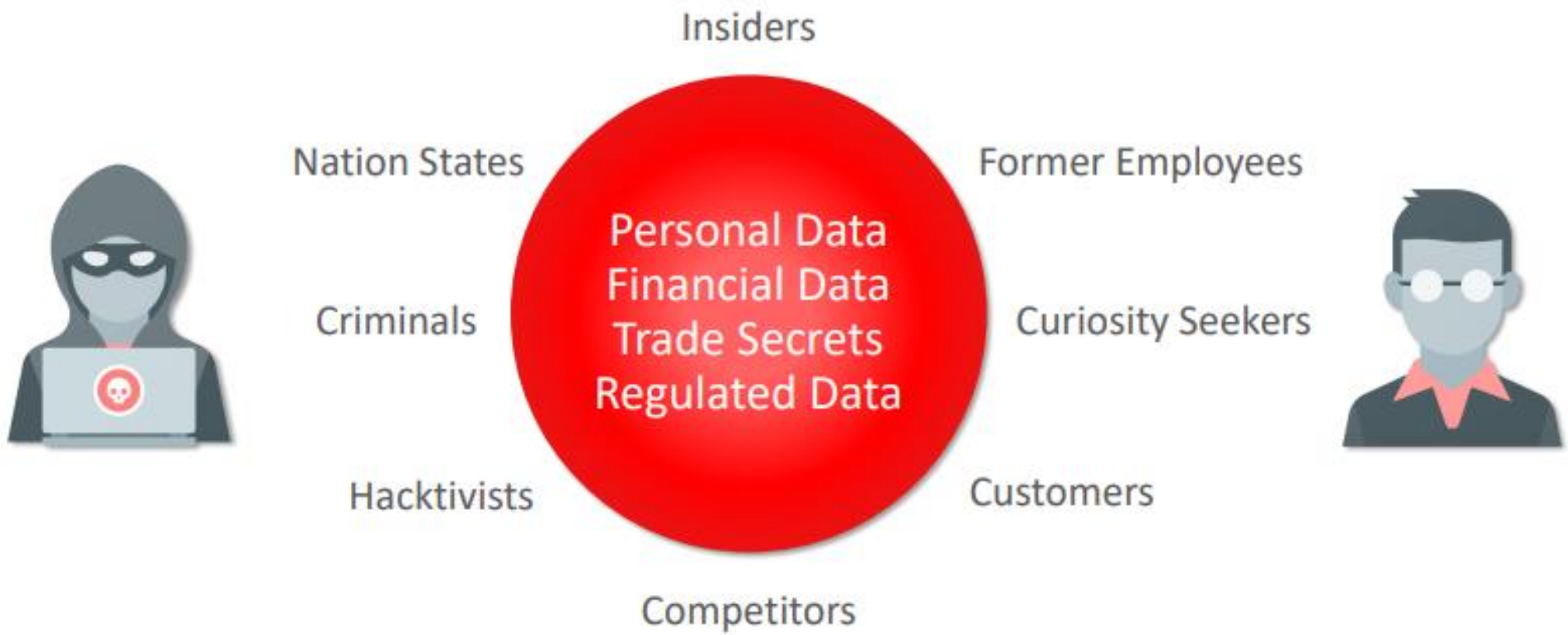
gbs
Soluciones de Negocios

Premisas

1. Las bases de datos siguen siendo atractivas para hackers o usos mal intencionados. Es un activo muy valioso
2. Necesidad de Cumplimiento regulatorio internacional y nacional (EU GDPR, PCI DSS, SOX, HIPAA/HITECH, LDPD, NTP, etc.)
3. Orientación y enfoque preventivo de seguridad



¿Quién quiere nuestra data?



¿Sabe cómo han evolucionado las técnicas de ataques?

¿Quiénes pueden vulnerar?

Insider / Outsider

¿Por dónde empezamos y qué buscar?

1. ¿Dónde residen los datos sensibles?
2. ¿Quiénes son los usuarios y sus derechos?
3. ¿Qué controles he aplicado in situ?
4. ¿Mi base de datos está configurada de forma segura?
5. ¿Tenemos un equipo de seguridad de base de datos?
6. ¿Tengo conocimiento en seguridad?
7. ¿Tengo tiempo para análisis regularmente?

Oracle Database Security Assessment Tool (DBSAT)

1. Configuración de seguridad

- Cifrado de datos
- Políticas de auditoría
- Control de acceso de granular
- Configuración de base de datos y escucha
- Permisos de archivos OS
- Parches de seguridad

2. Usuarios y derechos

- Cuentas de usuario, privilegios y roles

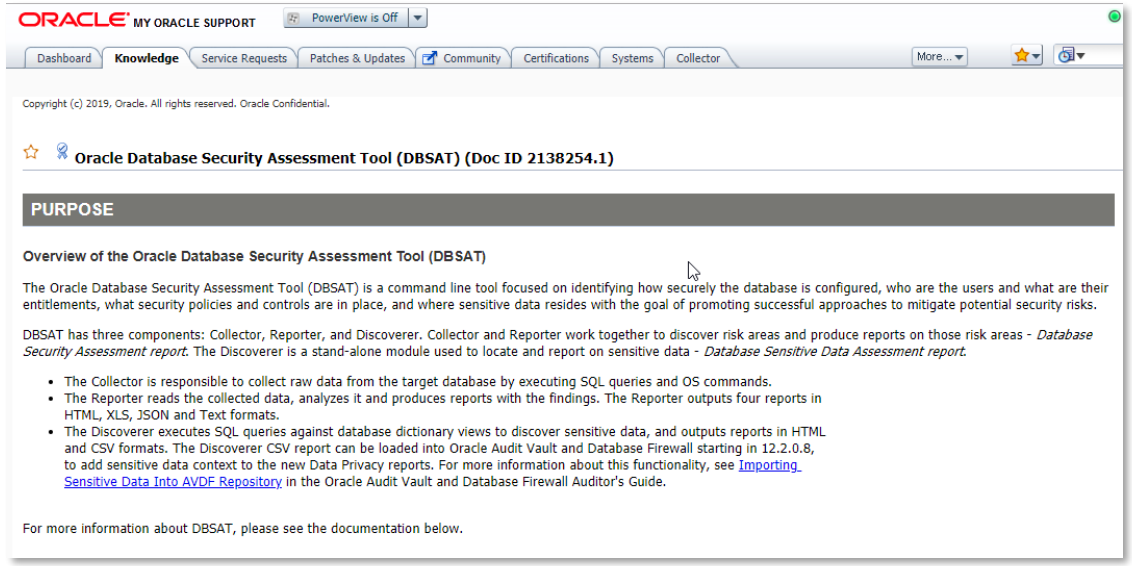
3. Datos sensibles

- ¿Qué tipo?, ¿dónde?, ¿cuántos?

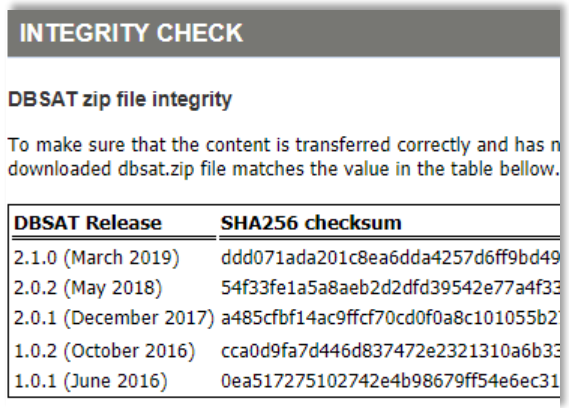
For Oracle Databases
10g and later

Descarga de Database Assesment Tool - DBSAT

Ingresar al portal de My Oracle Support con sus credenciales e ingresar a la nota técnica de referencia **Oracle Database Security Assessment Tool (DBSAT) (Doc ID 2138254.1)**



Validar la última versión actualizada

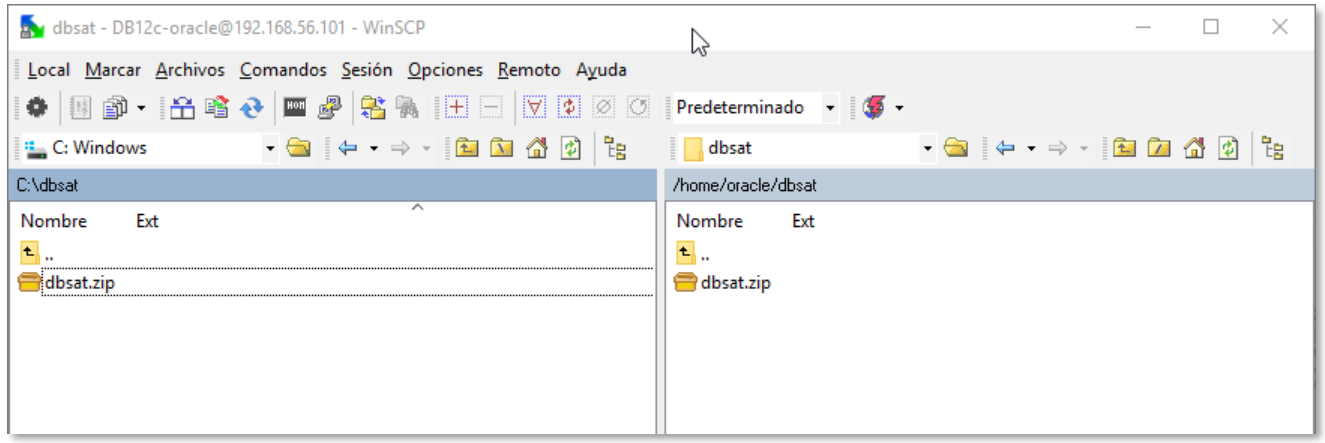


Transferir la herramienta dbsat al servidor

Iniciar sesión en el servidor con cuenta **oracle** a través del **WinSCP**

Crear el directorio **dbsat**

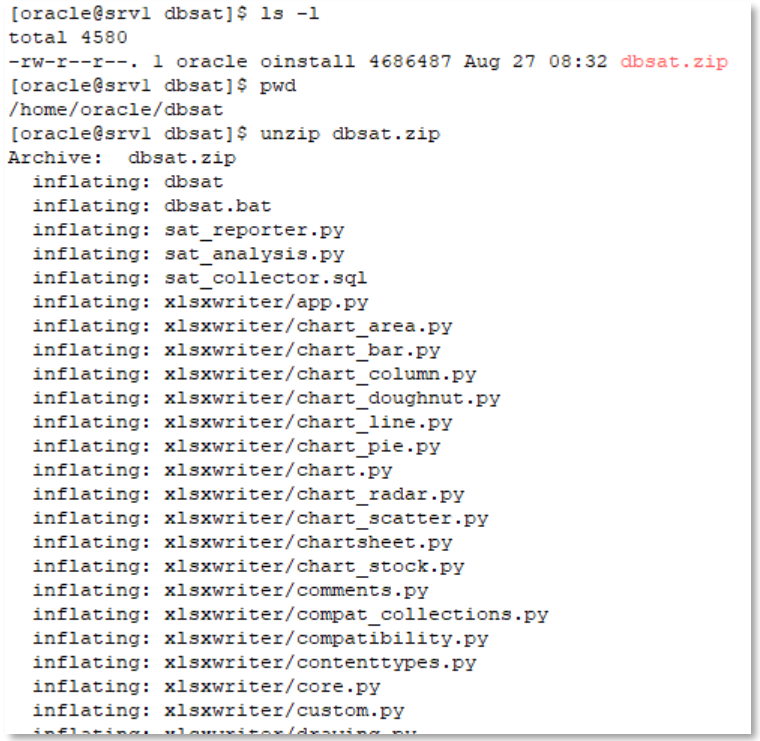
Transferir el utilitario **dbsat** en el directorio creado.



Validar el archivo transferido y descomprimir

Iniciar sesión vía putty e ingresar al directorio donde se aloja el archivo dbsat.zip

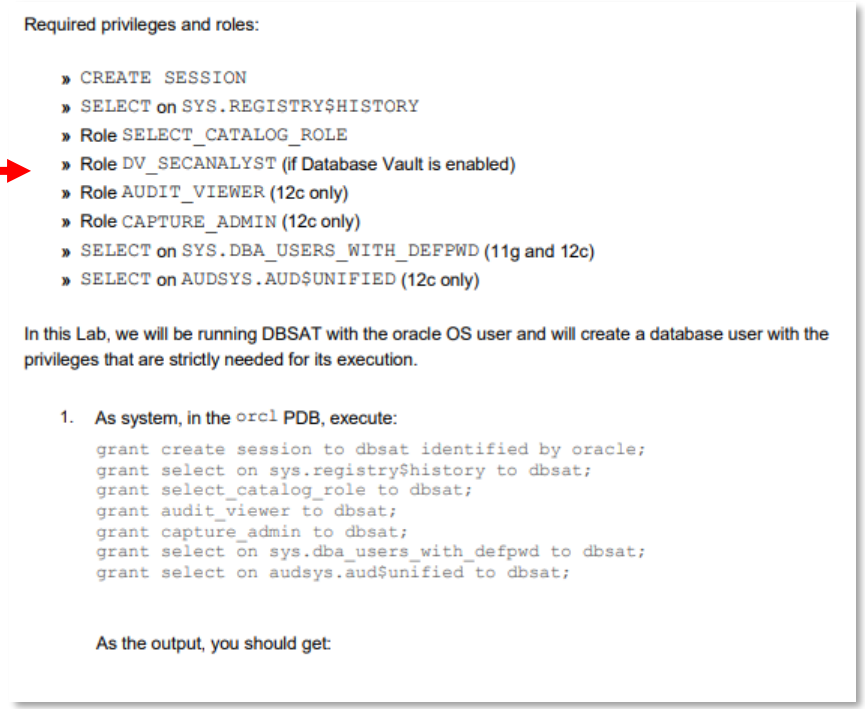
Descomprimir mediante el comando
unzip dbsat.zip



Creación de usuario de Base de Datos DBSAT

Se debe crear un nuevo usuario con nombre DBSAT (Nombre sugerido) y asignarle los siguientes privilegios.

Caso contrario la herramienta puede ser ejecutada con cuentas que tengan el privilegio DBA. (system, sys)



Required privileges and roles:

- CREATE SESSION
- SELECT on SYS.REGISTRY$HISTORY
- Role SELECT_CATALOG_ROLE
- Role DV_SECANALYST (if Database Vault is enabled)
- Role AUDIT_VIEWER (12c only)
- Role CAPTURE_ADMIN (12c only)
- SELECT on SYS.DBA_USERS_WITH_DEFPWD (11g and 12c)
- SELECT on AUDSYS.AUD$UNIFIED (12c only)

In this Lab, we will be running DBSAT with the oracle OS user and will create a database user with the privileges that are strictly needed for its execution.

1. As system, in the orcl PDB, execute:

```
grant create session to dbsat identified by oracle;
grant select on sys.registry$history to dbsat;
grant select_catalog_role to dbsat;
grant audit_viewer to dbsat;
grant capture_admin to dbsat;
grant select on sys.dba_users_with_defpwd to dbsat;
grant select on audsys.aud$unified to dbsat;
```

As the output, you should get:

Ejecución de la herramienta DBSAT – Módulo collect

Ingresar a la carpeta de dbsat y ejecutar
./dbsat collect system /home/oracle/dbsat/oradb

Ingresar el password del system:
password: **********

Generamos un password para la matriz de reporte
password: **********
password: **********

Se generará un archivo similar a **oradb.zip**

```
oracle@srv1:~/dbsat
[oracle@srv1 dbsat]$ ./dbsat collect system /home/oracle/dbsat/oradb

Database Security Assessment Tool version 2.1 (March 2019)

This tool is intended to assist in you in securing your Oracle database
system. You are solely responsible for your system and the effect and
results of the execution of this tool (including, without limitation,
any damage or data loss). Further, the output generated by this tool may
include potentially sensitive system configuration data and information
that could be used by a skilled attacker to penetrate your system. You
are solely responsible for ensuring that the output of this tool,
including any generated reports, is handled in accordance with your
company's policies.

Connecting to the target Oracle database...


SQL*Plus: Release 12.1.0.2.0 Production on Tue Aug 27 08:53:43 2019

Copyright (c) 1982, 2014, Oracle.  All rights reserved.

Enter password:
Last Successful login time: Tue Aug 27 2019 08:47:47 -05:00

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Advanced Analytics
and Real Application Testing options

Setup complete.
SQL queries complete.
OS commands complete.
Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Automatic Storage Management, OLAP, Advanced Analytics
and Real Application Testing options
DBSAT Collector completed successfully.

Calling /u01/app/oracle/product/12.1.0/db_1/bin/zip to encrypt oradb.json...

Enter password:
Verify password:
  adding: oradb.json (deflated 87%)
zip completed successfully.
```

Generación de reportes

Ejecutar el siguiente comando

./dbsat report oradb

Solicitará el password asignado anteriormente

Por último se observa que se generan los siguientes archivos:

oradb_report.txt
oradb_report.html
oradb_report.xlsx
oradb_report.json

Y se agrupan en el archivo comprimido

oradb_report.zip

```
[oracle@srv1 dbsat]$ ./dbsat report oradb

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are solely responsible for ensuring that the output of this tool,
including any generated reports, is handled in accordance with your
company's policies.

Archive:  oradb.zip
[oradb.zip] oradb.json password:
  inflating: oradb.json
Traceback (most recent call last):
  File "/home/oracle/dbsat/./sat_reporter.py", line 7131, in <module>
    fn()
  File "/home/oracle/dbsat/./sat_reporter.py", line 4669, in external_procedure
    extproc_envs[name] = env_val
TypeError: unhashable type: 'list'

DBSAT Reporter ran successfully.

Calling /usr/bin/zip to encrypt the generated reports...

Enter password:
Verify password:
        zip warning: oradb_report.zip not found or empty
  adding: oradb_report.txt (deflated 76%)
  adding: oradb_report.html (deflated 83%)
  adding: oradb_report.xlsx (deflated 3%)
  adding: oradb_report.json (deflated 81%)
zip completed successfully.
```

Reporte generado en formato HTML

Oracle Database Security Assessment

Highly Confidential

Assessment Date & Time

Date of Data Collection	Date of Report	Reporter Version
Tue Aug 27 2019 08:53:00	Tue Aug 27 2019 09:02:21	2.1 (March 2019) - 7a38

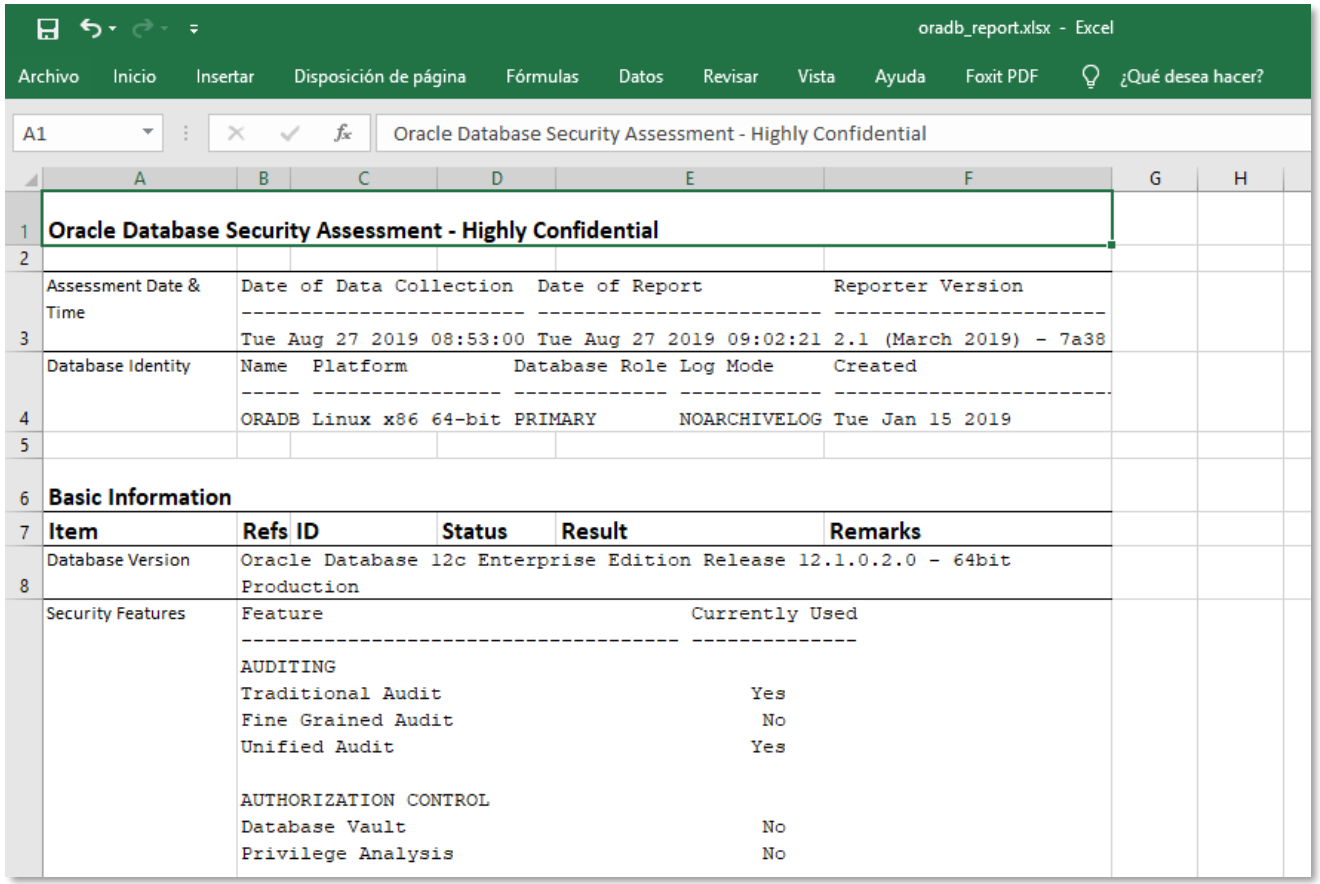
Database Identity

Name	Platform	Database Role	Log Mode	Created
ORADB	Linux x86 64-bit	PRIMARY	NOARCHIVELOG	Tue Jan 15 2019 10:43:00

Summary

Section	Pass	Evaluate	Advisory	Low Risk	Medium Risk	High Risk	Total Findings
Basic Information	0	0	0	0	0	0	**0**
User Accounts	5	0	0	4	2	1	**12**
Privileges and Roles	5	15	0	0	0	1	**21**
Authorization Control	0	0	2	0	0	0	**2**
Fine-Grained Access Control	0	1	4	0	0	0	**5**

Reporte generado en formato EXCEL



Reporte generado en formato TXT

```
### Oracle Database Security Assessment - Highly Confidential ###

* Assessment Date & Time *
Date of Data Collection  Date of Report           Reporter Version
------------------------ ------------------------ ------------------------
Tue May 14 2019 11:51:00 Tue May 14 2019 11:52:54 2.1 (March 2019) - 7a38

* Database Identity *
Name   Platform         Database Role Log Mode   Created
------ ---------------- ------------- ---------- ------------------------
OSILDB Linux x86 64-bit PRIMARY       ARCHIVELOG Mon Aug 22 2011 12:57:00

### Summary ###

Section                    Pass Evaluate Advisory Low Risk Medium Risk High Risk Total Findings
-------------------------- ---- -------- -------- -------- ----------- --------- --------------
Basic Information             0        0        0        0           0         1              1
User Accounts                 2        0        0        3           6         0             11
Privileges and Roles          5       15        0        0           0         1             21
Authorization Control         0        0        1        0           0         0              1
Fine-Grained Access Control   0        0        2        0           0         0              2
Auditing                      4        4        1        0           2         0             11
Encryption                    0        1        1        0           0         0              2
Database Configuration        6        2        0        3           4         0             15
Network Configuration         0        1        0        0           2         0              3
Operating System              1        1        0        2           1         0              5
Total                        18       24        5        8          15         2             72
```

Ejecución de la herramienta DBSAT – Módulo Discover

Ingresar al directorio
/home/oracle/dbsat/Discover/conf

Copiar el archivo **sample_dbsat.config** y colocarle el nombre **dbsat.config.**
Editar el archivo **dbsat.config** y agregar los parámetros necesarios

```
[oracle@srv1 dbsat]$ cd Discover/conf/
[oracle@srv1 conf]$ ls -l
total 212
-r--r--r--. 1 oracle oinstall  5136 Feb 28 11:27 sample_dbsat.config
-r--r--r--. 1 oracle oinstall 29090 Feb 28 11:27 sensitive_de.ini
-r--r--r--. 1 oracle oinstall 31911 Feb 28 11:27 sensitive_en.ini
-r--r--r--. 1 oracle oinstall 26829 Feb 28 11:27 sensitive_es.ini
-r--r--r--. 1 oracle oinstall 27308 Feb 28 11:27 sensitive_fr.ini
-r--r--r--. 1 oracle oinstall 25172 Feb 28 11:27 sensitive_it.ini
-r--r--r--. 1 oracle oinstall 26302 Feb 28 11:27 sensitive_nl.ini
-r--r--r--. 1 oracle oinstall 27424 Feb 28 11:27 sensitive_pt.ini
[oracle@srv1 conf]$ cp sample_dbsat.config dbsat.config
[oracle@srv1 conf]$
```

```
############################################################

#Database Section: Allows the user to provide DB server details
[Database]

#DB_IP is the IP address or FQDN for the DB Server
#default is localhost

        DB_HOSTNAME = localhost

#DB_PORT is the port at which the DBSAT tool needs to connect to
#default is 1521

        DB_PORT = 1521

#DB_SERVICE_NAME is the service Name for the DB
#default is empty

        DB_SERVICE_NAME = oradb

############################################################
```

Ejecución de la herramienta DBSAT – Módulo Discover

Validar variable de entorno JAVA_HOME: **Se requiere utilizar java 1.8 o superior**
Luego ejecutar el comando discover
./dbsat discover -c ./Discover/conf/dbsat.config oradb_discovery

Solicitará el ingreso de credenciales de un usuario con privilegios DBA
Y se deberá asignar un password para el archivo de reportes.

```
[oracle@srvl dbsat]$ echo $JAVA_HOME

[oracle@srvl dbsat]$ export JAVA_HOME=/u01/java/jre1.8.0_211/
[oracle@srvl dbsat]$ ./dbsat discover -c ./Discover/conf/dbsat.config oradb_discovery

Database Security Assessment Tool version 2.1 (March 2019)

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any damage or data loss). Further, the output generated by this tool may
include potentially sensitive system configuration data and information
that could be used by a skilled attacker to penetrate your system. You
are solely responsible for ensuring that the output of this tool,
including any generated reports, is handled in accordance with your
company's policies.

Enter username: system
Enter password:
DBSAT Discover ran successfully.
Calling /usr/bin/zip to encrypt the generated reports...

Enter password:
Verify password:
        zip warning: oradb_discovery_report.zip not found or empty
  adding: oradb_discovery_discover.html (deflated 85%)
  adding: oradb_discovery_discover.csv (deflated 82%)
Zip completed successfully.
[oracle@srvl dbsat]$
```
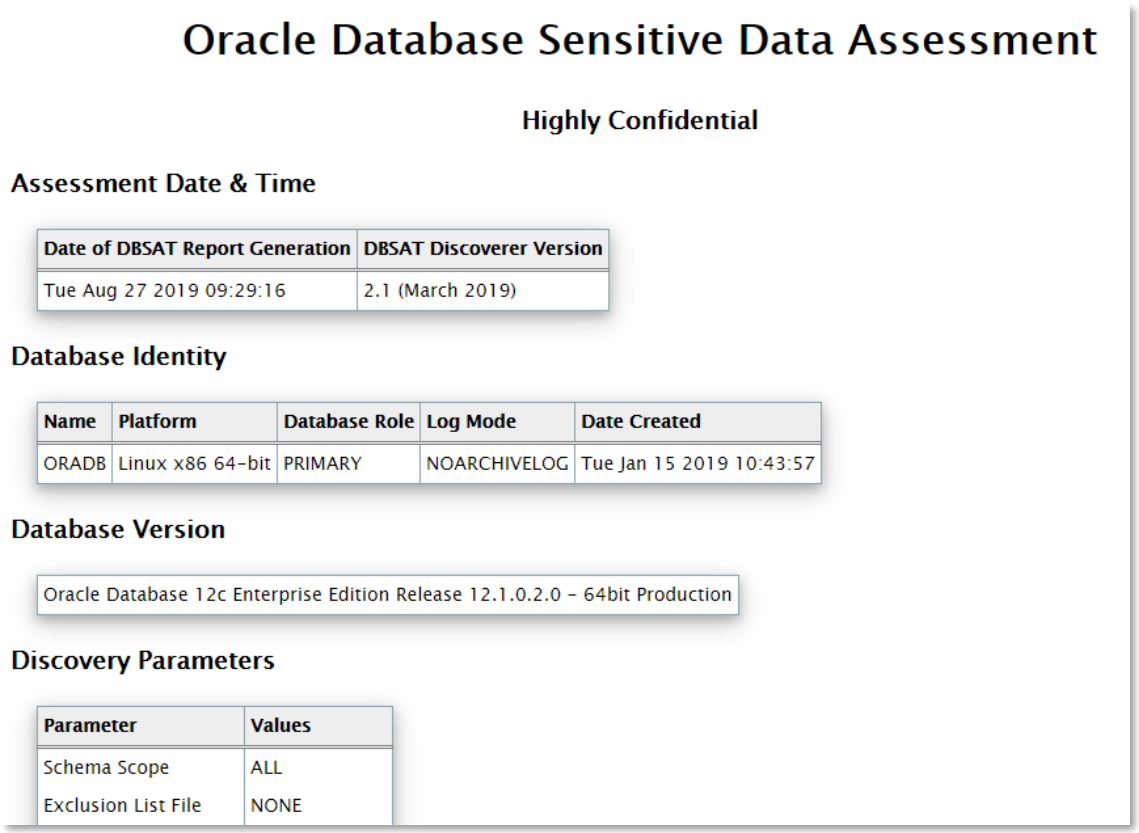

Reporte generado en formato HTML



Oracle Database Sensitive Data Assessment

Highly Confidential

Assessment Date & Time

Date of DBSAT Report Generation	DBSAT Discoverer Version
Tue Aug 27 2019 09:29:16	2.1 (March 2019)

Database Identity

Name	Platform	Database Role	Log Mode	Date Created
ORADB	Linux x86 64-bit	PRIMARY	NOARCHIVELOG	Tue Jan 15 2019 10:43:57

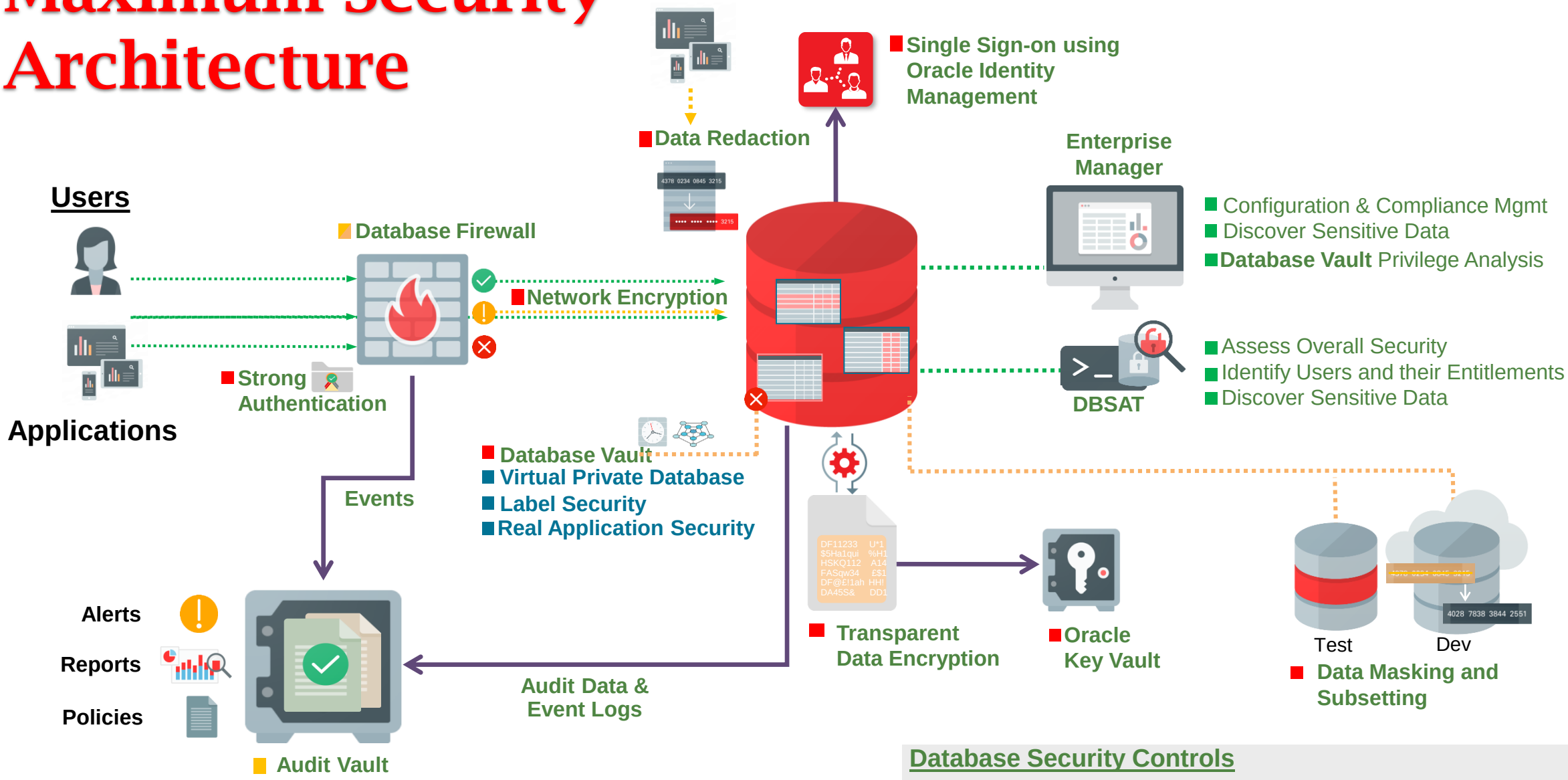
Database Version

Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production

Discovery Parameters

Parameter	Values
Schema Scope	ALL
Exclusion List File	NONE

Maximum Security Architecture



Database Security Controls

Evaluate | Prevent | Detect | Data Driven Security

2
3

Oracle Database Security Controls

EVALUATE	PREVENT	DETECT	DATA DRIVEN SECURITY
Database Vault		Database Firewall	Label Security
EM DB Life-Cycle Management Pack	Data Masking and Subsetting	Audit Vault and Database Firewall	Real Application Security
Security Assessment Tool (Free for Oracle customers)	Key Vault	Alerting & Reporting	(included in) DB Enterprise Edition
(included in) All security options	Data Redaction Advanced Security Data Encryption	(included in) DB Standard Edition	Crypto Toolkit for Applications

Gracias por tú participación

Perú