Demos EUS, Kerberos, SSL and OUD a guideline

A couple of demo's for the TechEvent presentation *EUS, Kerberos, SSL and OUD a guideline*. Be aware, that the code can not be used copy/past in all environments due to limitations on the line breaks.

Demos are shown on an Oracle 18c Docker based database.

```
docker run --detach --name te2018_eusdb \
  --volume /data/docker/volumes/te2018_eusdb:/u01 \
  -e ORACLE_SID=TE18EUS \
  -p 1521:1521 -p 5500:5500 \
  --hostname te2018_eusdb.postgasse.org \
  --dns 192.168.56.70 \
  --dns-search postgasse.org \
  oracle/database:18.3.0.0
```

Create user and roles

```
CREATE ROLE tvd_connect;
GRANT CREATE SESSION TO tvd_connect;
GRANT select ON v_$session TO tvd_connect;
CREATE USER SOE_KERBEROS IDENTIFIED EXTERNALLY AS '
   soe@POSTGASSE.ORG';
GRANT tvd_connect TO SOE_KERBEROS;
```

Password Verifier

Clean up and remove the old users.

```
DROP USER user_10g;
DROP USER user_11g;
DROP USER user_12c;
DROP USER user_all;
```

Create 4 dedicated test user and grant them *CREATE SESSION*.

```
GRANT CREATE SESSION TO user_10g IDENTIFIED BY manager;
GRANT CREATE SESSION TO user_11g IDENTIFIED BY manager;
GRANT CREATE SESSION TO user_12c IDENTIFIED BY manager;
GRANT CREATE SESSION TO user_all IDENTIFIED BY manager;
```

Reset all passwords using *IDENTIFIED BY VALUES* to explicitly set a particular password verifier.

```
ALTER USER user_10g IDENTIFIED BY VALUES '808E79166793CFD1'
   ;
ALTER USER user_11g IDENTIFIED BY VALUES 'S:22
   D8239017006EBDE054
    108BF367F225B5E731D12C91A3BEB31FA28D4A38';
ALTER USER user_12c IDENTIFIED BY VALUES 'T:
   C6CE7A88CC5D0E048F32
    A564D2B6A7BDC78A2092184F28D13A90FC071F804E5EA09D4D2A3749AA79

    BFD0A90D18DEC5788D2B8754AE20EE5C309DBA87550E8AA15EAF2746ED43

    1BF4543D2ABE33E22678';
```

See what we do have in *dba_users*.

```
set linesize 160 pagesize 200
col username for a25
SELECT username,password_versions FROM dba_users WHERE
   username LIKE 'USER_%' ORDER BY 1;

USERNAME          PASSWORD_VERSIONS
------------------------ ----------------
USER_10G          10G
USER_11G          11G
USER_12C          12C
USER_ALL          10G 11G 12C
```

See what we do have in *user$*.

```
set linesize 160 pagesize 200
col name for a20
col password for a20
col spare4 for a65
SELECT name,password,spare4 FROM user$ WHERE name LIKE '
   USER_%' ORDER BY 1;

NAME       PASSWORD          SPARE4
---------- ----------------
   ---------------------------------------
USER_10G   808E79166793CFD1
USER_11G                     S:22
   D8239017006EBDE054108BF367F225B5E7
                             31D12C91A3BEB31FA28D4A38
USER_12C                     T:
   C6CE7A88CC5D0E048F32A564D2B6A7BDC78A
                             2092184
                                F28D13A90FC071F804E5EA09D4D2A37

                             49
                                AA79BFD0A90D18DEC5788D2B8754AE20EE5C

                             309
                                DBA87550E8AA15EAF2746ED431BF4543D2A

                             BE33E22678

USER_ALL   BFD595809B6149CB  S:804
   A87EA761505458FDED9B057A77FCF53DA
                             3DDBD6EDB168501EDF5C0B10;T
                                :7950DF0D54D
                             EA24F1764EBC34A262D784E18F4292510B8A2E

                             0
                                D0F7ADFEC1C6F1E22D841A9D91BAF0B9B0563

                             2
                                F6D4898C6F4AE1EEF1509339EBCE261A1F36E

                             834
                                A5E2DD9F1E772AB2D6413CCAB5EB0B23
```

Check what we do have in *sqlnet.ora*.

```
host grep -i ALLOWED /u00/app/oracle/network/admin/sqlnet.
   ora
#SQLNET.ALLOWED_LOGON_VERSION_CLIENT=12a
```

```
SQLNET.ALLOWED_LOGON_VERSION_SERVER=11

host sed -i "s|^SQLNET.ALLOWED_LOGON_VERSION_SERVER.*|
   SQLNET.ALLOWED_LOGON_VERSION_SERVER=11|" \
    /u00/app/oracle/network/admin/sqlnet.ora
host sed -i "s|^SQLNET.ALLOWED_LOGON_VERSION_SERVER.*|
   SQLNET.ALLOWED_LOGON_VERSION_SERVER=12|" \
    /u00/app/oracle/network/admin/sqlnet.ora
host sed -i "s|^SQLNET.ALLOWED_LOGON_VERSION_SERVER.*|
   SQLNET.ALLOWED_LOGON_VERSION_SERVER=12a|" \
    /u00/app/oracle/network/admin/sqlnet.ora
```

Do some login tests

```
SQL> connect user_10g/manager
ERROR:
ORA-01017: invalid username/password; logon denied


Warning: You are no longer connected to ORACLE.

connect user_11g/manager
```

Setup Kerberos

Check the configuration scripts in *sqlnet.ora*.

```
grep -i -A 11 -B 2 "Kerberos Configuration" $TNS_ADMIN/
   sqlnet.ora

#
   ##############################################################

# Kerberos Configuration
#
   ##############################################################

SQLNET.AUTHENTICATION_SERVICES = (BEQ,KERBEROS5)
SQLNET.FALLBACK_AUTHENTICATION = TRUE
SQLNET.KERBEROS5_KEYTAB = /u00/app/oracle/network/admin/
   urania.keytab
SQLNET.KERBEROS5_REALMS = /u00/app/oracle/network/admin/krb
   .realms
SQLNET.KERBEROS5_CC_NAME = /u00/app/oracle/network/admin/
   krbcache
SQLNET.KERBEROS5_CONF = /u00/app/oracle/network/admin/krb5.
   conf
SQLNET.KERBEROS5_CONF_MIT=TRUE
SQLNET.AUTHENTICATION_KERBEROS5_SERVICE = oracle
```

Check the configuration scripts in *krb5.conf*.

```
cat $TNS_ADMIN/krb5.conf

####krb5.conf DB Server
[logging]
default = FILE:/u00/app/oracle/network/log/krb5lib.log
kdc=FILE:/u00/app/oracle/network/log/krb5kdc.log
admin_server=FILE:/u00/app/oracle/network/log/kadmind.log

[libdefaults]
```

```
 default_realm = POSTGASSE.ORG
 clockskew=300
 ticket_lifetime = 24h
 renew_lifetime = 7d
 forwardable = true

[realms]
 POSTGASSE.ORG = {
   kdc = mneme.postgasse.org
   admin_server = mneme.postgasse.org
}

[domain_realm]
.postgasse.org = POSTGASSE.ORG
postgasse.org = POSTGASSE.ORG
```

lookup hostname's and check DNS configuration

```
cat /etc/resolv.conf
# Generated by NetworkManager
search aux.lan postgasse.org
nameserver 192.168.56.70
nameserver 10.154.0.1
```

```
nslookup mneme.postgasse.org
Server:     192.168.56.70
Address:    192.168.56.70#53

Name:   mneme.postgasse.org
Address: 192.168.56.70
Name:   mneme.postgasse.org
Address: 10.0.2.19
```

```
nslookup te2018_eusdb.postgasse.org
Server:     192.168.56.70
Address:    192.168.56.70#53

Name:   urania.postgasse.org
Address: 192.168.56.90
```

Create a service principle in MS AD

Create the keytab file

```
ktpass.exe -princ oracle/te2018_eusdb.postgasse.
   org@POSTGASSE.ORG \
    -mapuser te2018_eusdb.postgasse.org -pass manager \
    -crypto ALL -ptype KRB5_NT_PRINCIPAL \
    -out C:\u00\app\oracle\network\te2018_eusdb.keytab
```

Connect as kerberos User

Table 1: Vulnerability

Vulnerability	Risk [^1]
V01	high [^99]
V02	gelb

Setup OUD AD Proxy

Requirements

Before you can start you may need a few things.

- Docker environment (eg. Docker community edition)
- OUD Docker Images in particular one for OUD 12.2.1.3 with the latest OUD base see oehrlis/docker soon you may also get the Dockerfiles from the Oracle Repository see pull request 911
- An MS AD Directory server or at lease a few credential to access one

Environment Variable

To type less you just have to define a few environment variables. Basically you will define the local Docker volume path, container name, container hostname and the OUD instance name.

```
export MY_CONTAINER="te2018_oud"
export MY_VOLUME_PATH="/data/docker/volumes/$MY_CONTAINER"
export MY_HOST="$MY_CONTAINER.postgasse.org"
export MY_OUD_INSTANCE="oud_adproxy"
```

Create the container

Just create a container without starting it. Adjust ports, base DN etc.

```
docker container create --name $MY_CONTAINER \
    --volume $MY_VOLUME_PATH:/u01 \
    -p 1389:1389 -p 1636:1636 -p 4444:4444 \
    -e OUD_CUSTOM=TRUE \
    -e BASEDN="dc=postgasse,dc=org" \
    -e OUD_INSTANCE=$MY_OUD_INSTANCE \
    --hostname $MY_HOST \
    --dns 192.168.56.70 \
    --dns-search postgasse.org \
    oracle/oud:12.2.1.3.180626
```

Get and configure your create scripts out of the container from the OUD base. Alternatively you may also get it directly from GitHub oehrlis/oudbase.

Get the OUD EUS AD templates from the Docker container created before.

```
mkdir -p $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE
docker cp \
    $(docker ps -aqf "name=$MY_CONTAINER"):/u00/app/oracle/
       local/oudbase/templates/create/oud12c_eus_ad_proxy \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE
mv $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/
   oud12c_eus_ad_proxy $MY_VOLUME_PATH/admin/
   $MY_OUD_INSTANCE/create
mkdir -p $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/etc
echo "manager" >$MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/etc/
   ${MY_OUD_INSTANCE}_pwd.txt
```

Update the *00_init_environment* according to your environment. In particular the variables AD_PDC_HOST,AD_PDC_PORT, AD_PDC_USER, AD_PDC_PASSWORD and BASEDN, GROUP_DN, USER_DN

```
vi $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
   _init_environment

sed -i -e "s|<PDC_HOSTNAME>|mneme.postgasse.org|g" \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment
sed -i -e 's|<USER_DN>|CN=OUD\\ Admin,CN=Users,dc=postgasse
   ,dc=org|g' \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment
sed -i -e "s|<PASSWORD>|manager|g" \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment

sed -i -e 's|^export BASEDN.*|export BASEDN="dc=postgasse,
   dc=org"|g' \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment
sed -i -e 's|^export GROUP_OU.*|export GROUP_OU="ou=Groups,
   dc=postgasse,dc=org"|g' \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment
sed -i -e 's|^export USER_OU.*|export USER_OU="ou=People,dc
   =postgasse,dc=org"|g' \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment
sed -i -e "s|dc=example,dc=com|dc=postgasse,dc=org|g" \
    $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
       _init_environment

cat $MY_VOLUME_PATH/admin/$MY_OUD_INSTANCE/create/00
   _init_environment
```

Lets go. Start the container and let the scripts create the OUD instance.

```
docker start $MY_CONTAINER
```

Enjoy the log and see how your OUD EUS AD proxy is created

```
docker logs -f $MY_CONTAINER
```

Setup EUS

```
dbca -configureDatabase -sourceDB $ORACLE_SID \
    -registerWithDirService true \
    -dirServiceUserName "cn=eusadmin" -dirServicePassword
       manager \
    -walletPassword TVD04manager -silent
```

Create a global DB User

```
DROP USER eus_users;
CREATE USER eus_users IDENTIFIED GLOBALLY;
GRANT tvd_connect TO eus_users;
```

Define a EUS mapping to the shared schema created before

```
eusm createMapping database_name="$ORACLE_SID" \
    realm_dn="dc=postgasse,dc=org" map_type=SUBTREE \
    map_dn="ou=People,dc=postgasse,dc=org" schema=EUS_USERS
        \
    ldap_host="te2018_oud.postgasse.org" ldap_port=1389 \
    ldap_user_dn="cn=eusadmin" \
    ldap_user_password="manager"
```

```
eusm listMappings database_name="$ORACLE_SID" \
    realm_dn="dc=postgasse,dc=org" \
    ldap_host="te2018_oud.postgasse.org" ldap_port=1389 \
    ldap_user_dn="cn=eusadmin" \
    ldap_user_password="manager"
```

Passwords are in docker logs or in the password files in $MY_VOLUME_PATH/admin/$MY_OUD_INSTA

check EUS connection

```
SQL> conn dinu/manager
Connected.
SQL> @sousrinf
Database Information
--------------------
- DB_NAME        : TDB122A
- DB_DOMAIN      :
- INSTANCE       : 1
- INSTANCE_NAME      : TDB122A
- SERVER_HOST        : urania
-
Authentification Information
----------------------------
- SESSION_USER       : EUS_USERS
- PROXY_USER         :
- AUTHENTICATION_METHOD : PASSWORD
- IDENTIFICATION_TYPE   : GLOBAL SHARED
- NETWORK_PROTOCOL   :
- OS_USER        : oracle
- AUTHENTICATED_IDENTITY: DINU
- ENTERPRISE_IDENTITY   : cn=Martin Berger,ou=People,dc=
   postgasse,dc=org
-
Other Information
-----------------
- ISDBA          : FALSE
- CLIENT_INFO        :
- PROGRAM        : sqlplus@urania (TNS V1-V3)
- MODULE         : SQL*Plus
- IP_ADDRESS         :
- SID            : 33
- SERIAL#        : 17568
- SERVER         : DEDICATED
- TERMINAL       : pts/1

PL/SQL procedure successfully completed.
```