# D1/04. Oracle at CERN

School on the Database Infrastructure for the CMS Phase 2 Upgrade

# Outline

- Oracle at CERN
  - Instances development, integration, production
  - Oracle Client, instance names
- OracleNet
  - TNS
- Hands-on with devdb18
  - sqlplus CLI
  - SQL Developer

# CERN DB instances

- Production
  - OMDS (P5)
  - CMSR (GPN)
- Integration
  - CMSINTR (P5)
  - INT2R (GPN)
- Development
  - devdb11 (GPN)
  - devdb18 (GPN)
- Other DBs can be looked up from the official `/etc/tnsnames.ora`

- Account can be requested by using CERN Resources Portal
  - https://resources.web.cern.ch
  - Have to justify new accounts

# Oracle Clients

- Oracle Instant Client
  - Free and light-weight Oracle Database tools, libraries and SDKs for building and connecting applications to an Oracle Database instance
  - https://www.oracle.com/technetwork/database/database-technologies/instant-client/overview/index.html
- Installation at CERN
  - `oracle-instantclient*` packages from `cernonly` repo
  - `oracle-instantclient-tnsnames.ora` package from `cernonly` repo
    - TNSNAMES.ORA updating mechanism for the ORACLE instantclient
    - wrapper package adds CERN-specific configuration information to the ORACLE instantlient, installs /etc/tnsnames.ora , /etc/sqlnet.ora and a cron job to update it hourly

# OracleNet

- Connectivity Services
  - enables a network session from a client application to an Oracle database server
  - data courier for both the client application and the database server
- Location Transparency service
  - allows a database client to identify the target database server
    - Oracle Net Directory naming, Local naming (TNSNAMES.ORA), Host naming, and External naming

# TNS
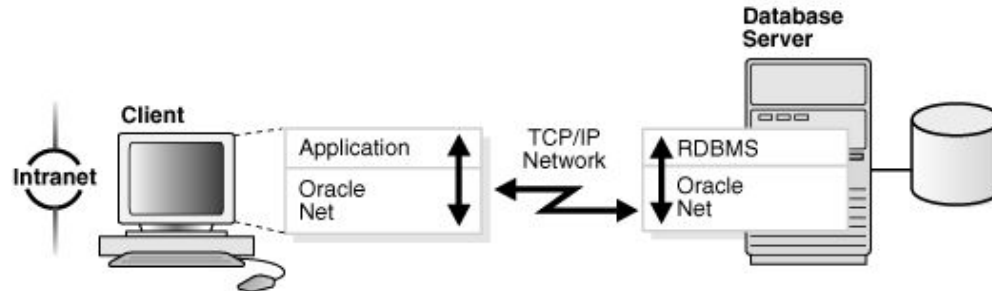
- Transparent Network Substrate (TNS)
  - a proprietary Oracle computer-networking technology
- tnsnames.ora configuration file
  - net service names mapped to connect descriptors for the local naming method
  - net service names mapped to listener protocol addresses
- Syntax

```
local_name =
    (DESCRIPTION =
        (ADDRESS = (address_information))
        (CONNECT_DATA = (
            SERVICE_NAME = service_name)
    )
)
```

# Oracle TNS hands-on

- Personal machine
  - (assuming that Oracle client is already installed)
  - Create tnsnames.ora file somewhere, i.e. `/etc/tnsnames.ora`
  - Add `devdb18` information (hint: copy from lxplus)
  - Create environment variable to point to file location, i.e.
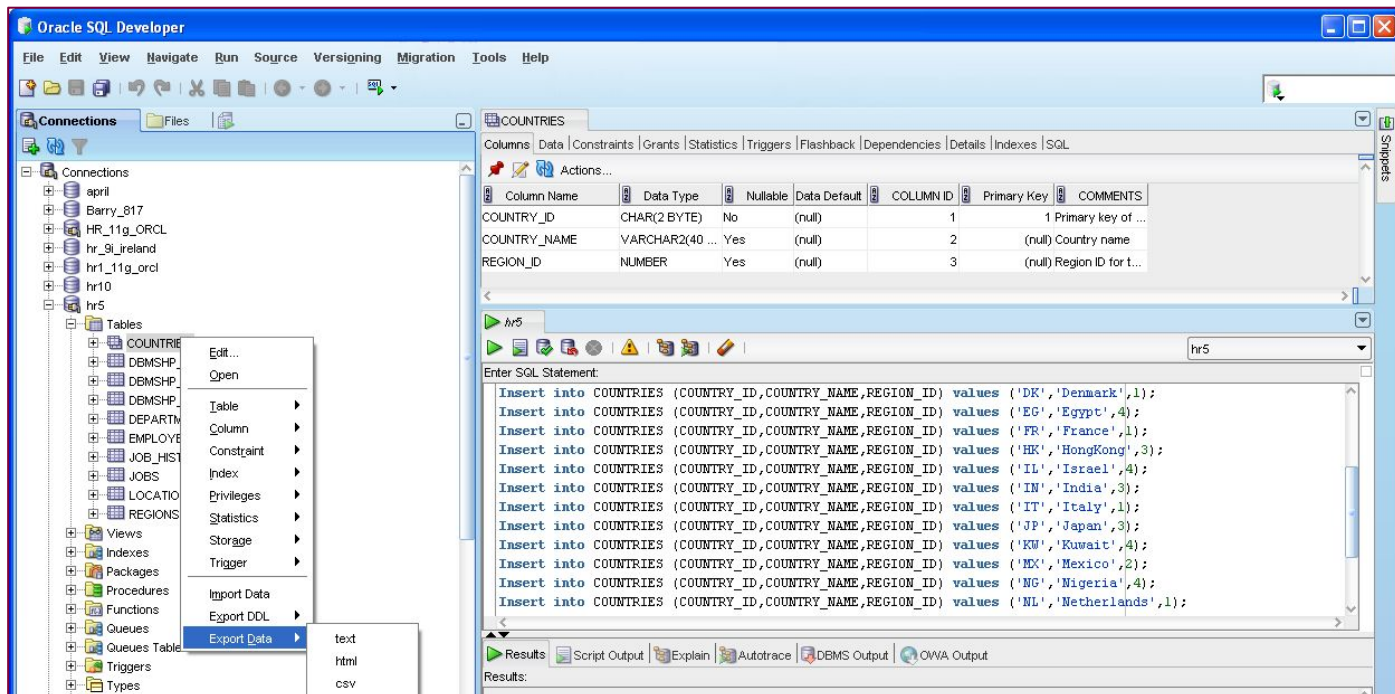
    ```
    export TNS_ADMIN=/etc
    ```

- Public service/lxplus
  - Explore `/etc/tnsnames.ora` file
  - Locate `devdb18` description

# Connect to devdb18 hands-on

- Use account details
  - Username: cms_trker_appuser_r
  - Password: Tracker_Reader_2017
  - Syntax
    - `sqlplus username/password@local_tns_name`

# Oracle SQL Developer

https://www.oracle.com/database/technologies/appdev/sql-developer.html

# SQL Developer hands-on

- Connect with SQL Developer
- Details:
  - Username: cms_trker_appuser_r
  - Password: Tracker_Reader_2017
  - Connection type: TNS

# Summary

- Oracle is available at CERN!
  - You can request account for your next project
- Before accessing Oracle DB
  - Install client
  - Configure tnsnames.ora - central configuration for your machine
- Connect to Oracle DB
  - sqlplus - for simple operations, script automation, batch executions
  - SQL Developer - browsing, development, ...