NATIONAL LANGUAGE SUPPORT

Oracle Database 21c XE | Language and regional settings

LANGUAGE | DATES | NUMBERS | CURRENCY

Why the same data can look different to different users

Before NLS: databases, tables and SQL

A database stores information. A table organizes it into rows and columns.

LAST_NAME	HIRE_DATE	SALARY
NOWAK	30-09-2005	7700.00
MARTIN	15-01-2012	9200.50
KOWALSKI	04-06-2021	6800.25

EXAMPLE SQL QUERY

```
SELECT last_name, salary
FROM NLS_EMPLOYEES;
```

Column

One type of information

Row

One employee record

SQL

Language for asking the database questions

What is a database session?

A session is one active conversation between a connected user and Oracle Database.

1 Open a client

SQL*Plus, SQL Developer or VS Code

2 Connect

User: SYSTEM
Service: XEPDB1

3 Work in a session

Run SQL commands and change session settings

A session has its own NLS preferences.

A second connection opens another session. Disconnecting ends the current one.

Two sessions can display the same value differently

STORED DATE

30 September 2005

Session A · English

Display format: DD-MON-YYYY
Result: 30-SEP-2005

Session B · French

Display format: DD FMMonth YYYY
Result: 30 Septembre 2005

Only the presentation changes. The stored DATE is the same in both sessions.

What does NLS control?

NLS = National Language Support. It controls language- and region-dependent behavior.

Language

Names of months, days and some messages

Date formats

For example: 06.11.2026 or 2026-11-06

Territory

Regional defaults for dates, numbers and money

Numbers

Decimal and thousands separators

Currency

Symbol or currency label next to amounts

Calendar & text

Calendar systems and character encoding

Where do NLS settings apply?

Database / instance

Provide system-level information and defaults

Your session

Has effective settings for your active connection

One SQL conversion

TO_CHAR can choose a language or format explicitly

Inspect the settings of your current session:

```
SELECT PARAMETER, VALUE
FROM NLS_SESSION_PARAMETERS
WHERE PARAMETER IN ('NLS_LANGUAGE','NLS_TERRITORY', 'NLS_DATE_FORMAT');
```

ALTER SESSION changes the active session — not every other user’s session.

Working with dates: values and formatting

DATE

Oracle stores a date/time value, not a particular language or printed date string.

TO_CHAR(...)

Converts a DATE to text using a chosen display format.

FORMATTING A DATE IN FRENCH

```
SELECT TO_CHAR(SYSDATE, 'DD FMMonth YYYY', NLS_DATE_LANGUAGE=FRENCH') AS FRENCH_DATE
FROM DUAL;
```

DD = day • **Month** = month name • **YYYY** = year • **FM** = remove padding

Numbers and currency: presentation, not conversion

One numeric value can be printed using different separators.

American convention

12,345.67 (group: comma / decimal: dot)

European convention

12.345,67 (group: dot / decimal: comma)

NLS_NUMERIC_CHARACTERS

Defines the decimal and grouping characters used by D and G in TO_CHAR.

NLS_CURRENCY changes the displayed label (e.g., PLN or USD). It does not exchange money.

Language, territory and calendar are different

NLS_LANGUAGE

General language and defaults; can affect some displayed messages.

NLS_DATE_LANGUAGE

Names of weekdays and months in formatted dates.

NLS_TERRITORY

Regional defaults such as date formats and currency.

NLS_CALENDAR

Calendar used for year and date components.

Example: Thai Buddha calendar can show year 2569 where Gregorian uses 2026.

Timestamps, calendars and character encoding

DATE

A date and time value, with precision to seconds.

TIMESTAMP

Can include fractional seconds. Its display has separate NLS settings.

Character set

How text characters are represented in the database. AL32UTF8 supports Unicode.

```
SELECT SYSTIMESTAMP FROM DUAL;
```

```
SELECT VALUE FROM NLS_DATABASE_PARAMETERS  WHERE PARAMETER = 'NLS_CHARACTERSET';
```

Fonts and client software must also support the characters you want to display.

Your first NLS experiment

Connect as SYSTEM to the XEPDB1 service in your Oracle XE Docker container.

1 Inspect

Check the current date format.

2 Change

Modify only your session.

3 Verify

Display the date again.

RUN THESE COMMANDS

```
SELECT VALUE FROM NLS_SESSION_PARAMETERS
WHERE PARAMETER = 'NLS_DATE_FORMAT';
ALTER SESSION SET NLS_DATE_FORMAT = 'YYYY-MM-DD';
SELECT SYSDATE FROM DUAL;
```

Open a NEW connection. Are the changes from the previous session still active?