**ORACLE DATA TYPES**

**Overview of Data Types**

A **data type** is a classification of a particular type of information or data. Each value manipulated by Oracle has a data type. The data type of a value associates a fixed set of properties with the value. These properties cause Oracle to treat values of one data type differently from values of another.

***Built-in Data Type Summary***

| **Data Type** | **Description** |
| --- | --- |
| VARCHAR2  (*size* [BYTE | CHAR]) | Variable-length character string having maximum length *size* bytes or characters. You must specify *size* for VARCHAR2. Minimum *size* is 1 byte or 1 character. Maximum size is:   * 32767 bytes or characters if MAX\_STRING\_SIZE = EXTENDED * 4000 bytes or characters if MAX\_STRING\_SIZE = STANDARD |
| NVARCHAR2(*size*) | Variable-length Unicode character string having maximum length *size* characters. You must specify *size* for NVARCHAR2. The number of bytes can be up to two times *size* for AL16UTF16 encoding and three times *size* for UTF8 encoding. Maximum *size* is determined by the national character set definition, with an upper limit of:   * 32767 bytes if MAX\_STRING\_SIZE = EXTENDED * 4000 bytes if MAX\_STRING\_SIZE = STANDARD |
| NUMBER [ (*p* [, *s*]) ] | Number having precision *p* and scale *s*. The precision *p* can range from 1 to 38. The scale *s* can range from -84 to 127. Both precision and scale are in decimal digits. A NUMBER value requires from 1 to 22 bytes. |
| FLOAT [(*p*)] | A subtype of the NUMBER data type having precision *p*. A FLOAT value is represented internally as NUMBER. The precision *p* can range from 1 to 126 binary digits. A FLOAT value requires from 1 to 22 bytes. |
| LONG | Character data of variable length up to 2 gigabytes, or 231 -1 bytes. Provided for backward compatibility. |
| DATE | Valid date range from January 1, 4712 BC, to December 31, 9999 AD. The default format is determined explicitly by the NLS\_DATE\_FORMAT parameter or implicitly by the NLS\_TERRITORY parameter. The size is fixed at 7 bytes. This data type contains the datetime fields YEAR, MONTH, DAY, HOUR, MINUTE, and SECOND. It does not have fractional seconds or a time zone. |
| BINARY\_FLOAT | 32-bit floating point number. This data type requires 4 bytes. |
| BINARY\_DOUBLE | 64-bit floating point number. This data type requires 8 bytes. |
| TIMESTAMP [(*fractional\_seconds\_precision*)] | Year, month, and day values of date, as well as hour, minute, and second values of time, where *fractional\_seconds\_precision* is the number of digits in the fractional part of the SECOND datetime field. Accepted values of *fractional\_seconds\_precision* are 0 to 9. The default is 6. The default format is determined explicitly by the NLS\_TIMESTAMP\_FORMAT parameter or implicitly by the NLS\_TERRITORY parameter. The size is 7 or 11 bytes, depending on the precision. This data type contains the datetime fields YEAR, MONTH, DAY, HOUR, MINUTE, and SECOND. It contains fractional seconds but does not have a time zone. |
| TIMESTAMP [(*fractional\_seconds\_precision*)] WITH TIME ZONE | All values of TIMESTAMP as well as time zone displacement value, where *fractional\_seconds\_precision* is the number of digits in the fractional part of the SECOND datetime field. Accepted values are 0 to 9. The default is 6. The default format is determined explicitly by the NLS\_TIMESTAMP\_FORMAT parameter or implicitly by the NLS\_TERRITORY parameter. The size is fixed at 13 bytes. This data type contains the datetime fields YEAR, MONTH, DAY, HOUR, MINUTE, SECOND, TIMEZONE\_HOUR, and TIMEZONE\_MINUTE. It has fractional seconds and an explicit time zone. |
| TIMESTAMP [(*fractional\_seconds\_precision*)] WITH LOCAL TIME ZONE | All values of TIMESTAMP WITH TIME ZONE, with the following exceptions:   * Data is normalized to the database time zone when it is stored in the database. * When the data is retrieved, users see the data in the session time zone.   The default format is determined explicitly by the NLS\_TIMESTAMP\_FORMAT parameter or implicitly by the NLS\_TERRITORY parameter. The size is 7 or 11 bytes, depending on the precision. |
| INTERVAL YEAR [(*year\_precision*)] TO MONTH | Stores a period of time in years and months, where *year\_precision* is the number of digits in the YEAR datetime field. Accepted values are 0 to 9. The default is 2. The size is fixed at 5 bytes. |
| INTERVAL DAY [(*day\_precision*)] TO SECOND [(*fractional\_seconds\_precision*)] | Stores a period of time in days, hours, minutes, and seconds, where   * *day\_precision* is the maximum number of digits in the DAY datetime field. Accepted values are 0 to 9. The default is 2. * *fractional\_seconds\_precision* is the number of digits in the fractional part of the SECOND field. Accepted values are 0 to 9. The default is 6.   The size is fixed at 11 bytes. |
| RAW(*size*) | Raw binary data of length *size* bytes. You must specify *size*for a RAW value. Maximum *size* is:   * 32767 bytes if MAX\_STRING\_SIZE = EXTENDED * 2000 bytes if MAX\_STRING\_SIZE = STANDARD |
| LONG RAW | Raw binary data of variable length up to 2 gigabytes. |
| ROWID | Base 64 string representing the unique address of a row in its table. This data type is primarily for values returned by the ROWID pseudocolumn. |
| UROWID [(*size*)] | Base 64 string representing the logical address of a row of an index-organized table. The optional *size* is the size of a column of type UROWID. The maximum size and default is 4000 bytes. |
| CHAR [(*size* [BYTE | CHAR])] | Fixed-length character data of length *size* bytes or characters. Maximum *size* is 2000 bytes or characters. Default and minimum *size* is 1 byte.  BYTE and CHAR have the same semantics as for VARCHAR2. |
| NCHAR[(*size*)] | Fixed-length character data of length *size* characters. The number of bytes can be up to two times *size* for AL16UTF16 encoding and three times *size* for UTF8 encoding. Maximum *size* is determined by the national character set definition, with an upper limit of 2000 bytes. Default and minimum *size* is 1 character. |
| CLOB | A character large object containing single-byte or multibyte characters. Both fixed-width and variable-width character sets are supported, both using the database character set. Maximum size is (4 gigabytes - 1) \* (database block size). |
| NCLOB | A character large object containing Unicode characters. Both fixed-width and variable-width character sets are supported, both using the database national character set. Maximum size is (4 gigabytes - 1) \* (database block size). Stores national character set data. |
| BLOB | A binary large object. Maximum size is (4 gigabytes - 1) \* (database block size). |
| BFILE | Contains a locator to a large binary file stored outside the database. Enables byte stream I/O access to external LOBs residing on the database server. Maximum size is 4 gigabytes. |