

## 3.2 INTERVALS

... and an ocean tumbled by with a private boat for Max  
and he sailed off through night and day  
and in and out of weeks  
and almost over a year  
to where the wild things are.

—Maurice Sendak, *Where the Wild Things Are*

And which of you by being anxious can add one cubit to his span of life?

—Matthew 6:27

An interval is an unanchored, directional duration of the time line.

An *interval* is an *unanchored* contiguous portion of the time line. An interval is relative; an instant is absolute. An interval can be added to an instant, yielding another instant. Intervals cannot be added to spatial points, nor spatial intervals (such as cubits) to temporal intervals, except as (often highly effective) literary

devices, as the above quotes illustrate.

The distance between two instants is an interval. Unlike instants, intervals have direction. An interval can be positive or negative, denoting a shift to the future or to the past.

Intervals are less prominent in the FINDER schema than instants. Some are signaled with “duration” or “interval” in their name, examples being the `Period_Durtn` column in `Well_Test_Period` and the `Sampling_Interval` column of the `Seis_Survey_Hdr` table, or by mentioning the time during which something was happening, as in the `Time_String_In_Hole` column of the `Well_Log_Service` table. Other interval columns are more obscure, such as the `Incrmnt_Time` column of the `Stage_Flowback` table (other columns having a name with that suffix denote instants, e.g., `Start_Time`). It appears that in the FINDER schema, all intervals are positive. As we’ll see, while SQL has an interval type, Oracle8 Server does not support this type, relying on the designer to differentiate instants from intervals in other ways.

### 3.2.1 The INTERVAL Type

Solid stone is just sand and water, ...  
Sand and water, and a million years gone by

—Beth Nielsen Chapman, “Sand and Water”

### Sundials

A sundial, or more ostentatiously, a *heliochronometer*, in contrast to most other clocks, does not measure an interval of time; rather, it indicates a given instant of time. A sundial can be moved to another longitude and remain accurate; a mechanical watch must be reset when moved—hence the presence of multiple time zones on many modern watches.

Sundials, when adjusted for the correct latitude, are exceedingly accurate, measuring true solar time (see page 95), at least when the sky is not cloudy. There is no drift with a sundial, unlike mechanical clocks.

The SQL-92 interval type is complex. Whereas the other SQL types require but a few lines to describe, intervals require over three *pages* just to specify the syntax. Even then, some details are left unstated (as will be discussed in Section 3.7.3).

SQL differentiates year-month intervals and day-time intervals. The first can be considered to be equivalent to an integral number of years or months; the latter considered equivalent to an integral number of days, hours, minutes, seconds, or fractions of a second. This distinction is due to varying month lengths in the Gregorian calendar. The individual units (months, hours, microseconds) are termed *granules*, so an interval value is a (signed) integer number of granules.

Intervals have a qualifier that specifies the leading field, an optional trailing field, and an optional precision for the leading and trailing fields.

Intervals are combinations of the fields year, month, day, hour, minute, and second, though not all combinations are allowed, as we will see. Intervals have a qualifier associated with them that specifies the leading field, an optional trailing field, and an optional precision for the leading and trailing fields. If no trailing field is present, the interval contains only the leading field.

### 3.2.2 Year-Month Intervals

For year-month intervals, the only fields available are year and month. Such an interval can contain only years (INTERVAL YEAR), only months (INTERVAL MONTH), or both (INTERVAL YEAR TO MONTH). For the leading or only field, a precision, specifying the maximum number of digits, is permitted (INTERVAL YEAR(*p*), INTERVAL MONTH(*p*), INTERVAL YEAR(*p*) TO MONTH); the precision defaults to two digits and must be positive. Nonleading fields can have up to two digits.

Year-month intervals contain a year, a month, or both fields. Year-month literals are denoted with the year (e.g., INTERVAL '3' YEAR), the month (e.g., INTERVAL '7' MONTH), or the year followed by a hyphen followed by the month (e.g., INTERVAL '3-7' YEAR TO MONTH, for three years and seven months). Note that the fields must be specified in literals, but the precision need not be. If years and months are present, then the number of months must be between 1 and 12. The length, in positions, of a year-month interval is the precision of the year field