

Temporal Enumerated Ranges (TEMPER)

(<http://www.cdlib.org/inside/diglib/temperspec.pdf>)

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Abstract

TEMPER (TEMPoral Enumerated Ranges) is a simple date and time syntax for representing points, lists, and ranges of timestamps. The syntax is designed to be trivial to parse, easy for humans to read, and friendly to basic lexical sorting algorithms. Examples:

```
BCE1212  
bce0551  
1850~  
1952, 1958-1967, 1975  
19990916_z  
19990916145903_z  
20070401
```

1. TEMPER Points

A TEMPER *point* is a string of characters representing a single date or a combination of a date and a time. Sometimes a point is called a timestamp. Here are some examples of TEMPER points.

0384	The year 384.
1999	The year 1999.
19990916145903	3rd second past 2:59 PM, 16 September 1999.
19990916145903_z	The same time, but in UTC time.
1999091614590312	12 seconds later, no specified time zone.
20041201	December 1st in the year 2004.

There are five different lengths of basic TEMPER points:

CCYY	4-digit year, with CC for 2-digit century
CCYYMMDD	8-digit year-month-day
CCYYMMDDhh	10-digit year-month-day-hour
CCYYMMDDhhmm	12-digit year-month-day-hour-minute
CCYYMMDDhhmmss	14-digit form with hour-minute-second

TEMPER points of 15 digits or more indicate fractions of seconds:

1999091614590312	No fractional seconds.
1999091614590312986	986 milliseconds later.

As a special case, to specify just a year and month without naming a day in the month, give DD as 00:

CCYYMM00	8-digit year-month, but no day specified
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For example,

20070500	The month of May in the year 2007.
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A 6-digit form is reserved for a downgraded TEMPER idiom that expresses a year-month-day with only a 2-digit year (i.e., the 2-digit century is missing):

YYMMDD	6-digit year-month-day (not recommended)
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6-digit points are not recommended because they will not sort correctly unless all the other dates (a) are 6-digit TEMPER points and (b) have the same implicit century.

1.1. TEMPER Zones

The basic TEMPER point may optionally be followed by an '_' (underscore) and a zone indicator of either 4 digits or 1-3 digits:

19990916145903_0000	Greenwich Mean Time (GMT).
19990916145903_GMT	Greenwich Mean Time (GMT).
19990916145903_0100	One hour WEST of GMT.
19990916145903_2300	One hour east of GMT.
19990916145903_PST	US Pacific Standard time.
19990916145903_edt	US Eastern Daylight time.
19990916145903_EDT	US Eastern Daylight time.
19990916145903_z	UTC (Coordinated Universal Time).

In the absence of a zone indicator, TEMPER does not define a default.

1.2. Approximate and Uncertain Points

Any TEMPER point followed by a ‘~’ (tilde) is interpreted as an approximate point, indicating ambiguity or fuzziness in the point. Because the tilde follows the TEMPER point, approximate and precise dates will be placed together by normal sorting software. There is currently no way in TEMPER to express the confidence level or the extent of variation (plus or minus values). Examples:

1066~	Circa the year 1066.
20020800~	August 2002 or thereabouts.
19781201020000~	Around 2 AM on December 1st, 1978.

TEMPER reserves the ‘?’ for expressing uncertain points; the details of uncertain points are under construction.

1.3. Non-Gregorian Calendars

A TEMPER point may be preceded by the three letters "BCE" for "Before Common Era" dates. These three ASCII letters express (with no case sensitivity) "negative" dates, namely, dates that are chronologically less than the year 0000. Examples:

BCE1212	Death of Rameses the Great.
bce0551	Birth of Confucius.

Note that BCE dates inherently sort in reverse order. But because "BCE" appears first in TEMPER dates, naive sorting software (e.g., Unix "sort" command with no arguments) first places all BCE dates together as a group, after which the simple intervention of reversing the order of the group achieves correct chronological order.

TEMPER reserves all 3-letter (alphabetic) prefixes for future use to indicate Hebrew, Chinese, Islamic, and other calendars; these are under construction. Although naive sorting will not work between calendars, use of prefixes will cause sorting to work on groups of dates that use the same calendar. The prefix "IBA" (from Tagalog) is defined to mean "other unspecified", as in,

IBA 28 May, 2004

2. TEMPER Ranges and Lists

A TEMPER *range* is a start point and an end point separated by a hyphen.

1996-2000	A range of four years.
2004-	The year 2004 and later.

A missing start or end point indicates an open-ended range. In general, a missing start point is strongly discouraged because it disturbs sorting among records from other sources, e.g., shifting a modern date range so that it appears near prehistoric dates; usually, it works better at least to approximate the start point.

1860~	Around 1860 and up to 1872.
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A TEMPER *list* is one or more points and ranges separated by commas. Every point in a list must have the same number of digits; e.g., a 14-digit point and a 4-digit range end point cannot occur in a valid TEMPER list. Points and ranges in a list may occur in any order. Here are some examples of lists.

1952, 1957, 1969	A list of three years.
1952, 1958-1967, 1985	A mixed list of dates and ranges.

3. Security considerations

The TEMPER syntax poses no direct risk to computers and networks. Implementors should always exercise care when receiving data that may be private or maliciously intended. These are normal risks to which TEMPER is no more vulnerable than most other syntaxes.

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5. Informative References

[ISO8601] ISO, "Data elements and interchange formats -- Information interchange -- Representation of dates and times", December 2004.

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Expires 1 February 2008

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