Temporal Enumerated Ranges (TEMPER)

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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-
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
- CCYYMMDDhhmss 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

For example,

20070500  The month of May in the year 2007.

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)

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:
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:

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,
2. TEMPER Ranges and Lists

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

<table>
<thead>
<tr>
<th>Start Point</th>
<th>End Point</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-2000</td>
<td>A range of four years.</td>
<td></td>
</tr>
<tr>
<td>2004-</td>
<td>The year 2004 and later.</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Start Point</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860--1872</td>
<td>Around 1860 and up to 1872.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Start Point</th>
<th>Description</th>
</tr>
</thead>
</table>

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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