

The Chronos Date/Time Library

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What is Chronos?

Chronos is a reusable code library, written in **Smalltalk**, for the creation of and computations with date and time values. It provides classes to represent and perform computations with point-in-time values, temporal extents (**durations of time**) and **temporal intervals** (specific periods of time, such as the quarter from 15 July 2005 through 14 October 2005.) Chronos implements the **ANSI-Smalltalk Standard DateAndTime**, DateAndTimeFactory, **Duration** and DurationFactory protocols.

Currently, there are versions available for VisualWorks, Squeak and Dolphin--although the Squeak and Dolphin versions lack some of the functionality herein described.

Chronos has been designed and architected for inter-Smalltalk portability. It is intended as a reference/standard implementation of advanced, rich date/time functionality for all Smalltalk flavors.

The current distribution is a beta version--mostly because there will probably be significant API changes in order to more fully support leap seconds.

Chronos Functionality Summary

- **Supports business, legal, historical and scientific use cases:**
 - Provides time-of-day-preserving date arithmetic, so that adding days or months doesn't change the time-of-day when crossing a DST transition.
 - Provides full support for both scientific (scale-invariant) and civil (calendar/business/legal) durations.
 - Supports point-in-time values that are either invariant to Universal Time (as required by the ANSI Standard) or invariant to nominal time. UT-invariant point-in-time values compare as equal to all others whose designation in Universal Time is the same--regardless of their time zone or designation in local time. Nominal-time-invariant point-in-time values compare as equal to all others with the same local ("nominal") time, regardless of time zone or designation in Universal Time--so a single instance can correctly specify the first moment of New Year's Day (of a particular year) in any time zone.

(Example of a problem solvable by means of nominal-time invariance.)

- Provides for the **definition/detection of annually-recurring events** (e.g., holidays, anniversaries, legal deadlines, number of trading days on the NYSE between two dates...)
- Provides resolution down to the nanosecond.
- **Provides comprehensive time zone functionality:**
 - Fully supports the world-wide time zone rulesets defined by the Olson Timezone Database (the native time zone database of UNIX/MacOS X.)
 - **Supports diachronic time zone rules that can change from one year to the next** (For example, although you *might* know that Hawaii's current time zone offset is -10 hours, what you *might not* know is that on Dec 7, 1941 Hawaii's time zone offset was -10:30 hours. Chronos, however, knows this.)
 - **Can automatically discover the local time zone** from the Windows Registry or from the TZ "Environment Variable" (UNIX/MacOS X or Windows.)
 - Enables updating time zone rules without changing your application code (**NOTE: US Daylight Saving Time extended by 4 weeks**)
- **Supports various calendrical systems** in addition to the international standard Gregorian calendar (e.g., Julian, Hebrew, Islamic, Persian...).
- Provides very flexible formatting of date/time values, including extensible support for multiple locales, and "built in" support for ISO 8601 and RFC 2822 formats.
- Provides very flexible parsing of dates, times and date-and-time values from character data--including full support for ISO 8601, RFC 2822, time zone names, time zone abbreviations and time zone offsets.
- **Provides high performance--usually significantly faster than the competition.**

To learn more, or to download the code, select one of the topics from the list on the left-hand side of the page.



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"Do not go gentle into that good night,
Old age should burn and rave at the close of the day;
Rage, rage at the dying of the light!" -- Dylan Thomas