

# Querying and reasoning about Extended Dates and Times as **Linked Data**

## Extended Dates and Times

The Extended Date and Time Format (EDTF) was developed at the Library of Congress and is now incorporated into the ISO 8601 standard for representing dates and times. It specifies a standard syntax for recording:

### uncertain and/or approximate dates

**2021-07~**      *around July 2021*

**?2021-07-~20**    *in July, around the 20th, maybe in 2021*

### dates with missing parts

**202X**      *sometime in the 2020s*

**XXXX-07-XX**    *some day in July in some year*

### sets of dates

**[2020, 2021, 2023..2025]**    *one of the years 2020, 2021, 2023, 2024, or 2025*

**{2020, 2021-07}**    *the year 2020 and the month July of 2021*

### intervals of time

**2020/2021-07**    *starting sometime in 2020 and ending sometime in July 2021*

**2021-07-20/**    *starting July 20, 2021 and ending at an unknown time*

EDTF provides a compact, standardized syntax for complex datetime expressions, but it requires special EDTF-specific libraries to do things like comparison and sorting with EDTF strings.

## Time Ontology in OWL

The Time Ontology in OWL (OWL-Time) defines classes and properties for describing the individual elements of dates and times as separate resources, so that they can be queried and reasoned about as triples, rather than strings.

```
ex:posterSessionStartDescription
  a          :DateTimeDescription ;
  :unitType  :unitMinute ;
  :minute    15 ;
  :hour      13 ;
  :timeZone  wikidata:Q2086913 ;
  :day       "----20"^^xsd:gDay ;
  :dayOfWeek :Tuesday ;
  :month     "--07"^^xsd:gMonth ;
  :year      "2021"^^xsd:gYear .
```

However, OWL-Time alone cannot express all of the date constructs covered by EDTF.

## Bridging the Gap

The EDTF Ontology provides concepts for expressing EDTF constructs using OWL-Time. The goal is to support translation of EDTF strings into structured descriptions that can be queried and reasoned about using standard RDF/OWL tools.

<https://periodo.github.io/edtf-ontology/>

While the draft ontology covers the entirety of EDTF, there is still work to be done:

- rules for automatically converting EDTF strings to triples
- mapping to other temporal ontologies such as CIDOC-CRM
- perhaps supporting SHACL or ShEx as an alternative to OWL

If you're interested, please get involved:

<https://github.com/periodo/edtf-ontology/discussions>

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