A brief history of Time(Zones) and the TZ Database

Eliot Lear
Standard Time

- Clock towers provided local time since antiquity
- British Railways began carrying chronometers around 1847
- This de facto standard became known as Railway Time

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The First Official Time Zone?

Great Britain (1880)

New Zealand (1868)
Meanwhile Back in the United States…

William F. Allen’s 1883 time zone map
The TZ Database, Pictorially

Courtesy: Eric Muller
Why should anyone care?

• Many events are synchronized across a network
  Meetings, room availability, people availability
  Recording devices need local time

• Access controls use local time
  “Don’t allow little Johnny to watch TV past 10pm”

• Some laws talk about time of day
  Noise regulations
  Content restrictions
Time zones

A time zone is a region of the earth that has uniform standard time, usually referred to as the local time.

Daylight Savings Time

- A seasonal one hour increase in local time
- Originally proposed by G.V. Hudson of New Zealand in 1895
- Independently developed and professed by William Willett from 1904
- First implemented by Germany and her Allies on April 30, 1916
UTC != Local Time != DST…

• UTC is the same across the planet
• Local time within a timezone is the same, absent DST considerations
• Each of these units are political determinations
• DST in particular tends to be volatile
How volatile is Local Time?

Source: TZ Database
How volatile is Local Time?

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Continuity & Ambiguity through DST Transition

- Local time with time zones is not a continuous function.

Discontinuities or ambiguities occur when an event is scheduled in the period in question.
Why Have ANY Time Zones?

Three reasons

- People like light
- People like regularity
- And there are ca. 500 separate time zones, and we’ll never get rid of them.

Courtesy: CIA World Factbook
Within Computing

Five Common Representations

• Naked offsets
  Commonly implemented on old cell phones and old software

• TZ Database
  Commonly implemented in Linux and Java

• Windows TZ Database(s)
  Commonly implemented on Windows

• IEEE 1003.1 TZ string
  Implemented on POSIX-compliant Oses

• RFC-2445 VTIMEZONEs
  Part of calendaring and scheduling standard
Why not just use naked offsets or nothing?

- Simplest to represent. Simply specify local time and an optional offset.
- But…
- Requires a flag day to update the offset
- No notion of what time it is anywhere else
TZ Database

- Dates back to 1980s
- Based on contributions of hundreds of people
- Contains perhaps the most comprehensive and complete TZ history.
- Managed By Arthur David Olson and Paul Eggert
- Database and most of the associated code are in the public domain
### Olson TZ Database Example

<table>
<thead>
<tr>
<th># Rule</th>
<th>NAME</th>
<th>FROM</th>
<th>TO</th>
<th>TYPE</th>
<th>IN</th>
<th>ON</th>
<th>AT</th>
<th>SAVE</th>
<th>LETTER/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule</td>
<td>Swiss</td>
<td>1941</td>
<td>1942</td>
<td></td>
<td>May</td>
<td>Mon&gt;=1</td>
<td>1:00</td>
<td>1:00</td>
<td>S</td>
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<tr>
<td>Rule</td>
<td>Swiss</td>
<td>1941</td>
<td>1942</td>
<td></td>
<td>Oct</td>
<td>Mon&gt;=1</td>
<td>2:00</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># Zone</th>
<th>NAME</th>
<th>GMTOFF</th>
<th>RULES</th>
<th>FORMAT</th>
<th>[UNTIL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone</td>
<td>Europe/Zurich</td>
<td>0:34:08</td>
<td>LMT</td>
<td>1848 Sep 12</td>
<td></td>
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<td></td>
<td></td>
<td>0:29:44</td>
<td>BMT</td>
<td>1894 Jun</td>
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<td>Bern Mean</td>
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<td>Time</td>
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<td></td>
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<td>CE%ST</td>
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<td></td>
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<td>1981</td>
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</tr>
</tbody>
</table>
The natural place to provide for time zone information is... The Network!

- RFC-4833 provides two new options for both IPv4 and IPv6
  One for Olson
  One for POSIX
- Example:

```bash
ip dhcp pool mynet
  network 10.12.173.112 255.255.255.240
  default-router 10.12.173.113
  option 101 ascii "Europe/Zurich"
  domain-name example.com
```
So Everything’s Cool. Right?

- Unfortunately not.
- Arthur David Olson is due to retire in 2012.
- There is no succession plan (yet).
- There is no license structure, because the DB is public domain.
- There is no place to store the data yet.
- There is no home for the mailing list yet

Salvadore Dali. Source: Wikimedia Commons Author Ines Zgonc
Requirements

• A home for the database
• A process for managing it
• A maintainer

• We need to preserve the current collaboration!
draft-lear-iana-timezone-database

- Transfers responsibility of hosting the database and supporting code to the IANA
- Transfers selection of the maintainer to the IESG
- Transfers management of the mailing list to IANA
- Sets forth guidance on how decisions are made, by documenting existing practice.
- Deals with IPR associated with support code that is also distributed
What is needed now

• Review of the document by the community

• Endorsement of the approach by the community
   OR feedback on how to improve the approach

• One or more volunteers who know something about time
Thank you.
Time is short…