XEP-0082: XMPP Date and Time Profiles

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This document specifies a standardization of ISO 8601 profiles and their lexical representation for use in XMPP protocol extensions.

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Contents

1 Introduction

A number of XMPP protocol extensions specify that dates and times should follow the format defined in ISO 8601 [1]. Unfortunately, ISO 8601 provides a great deal of flexibility with regard to the possible date and time "profiles" [2] as well as their lexical representation. While that flexibility can lead to confusion, it is also true that the Jabber/XMPP community has tended to use only a few restricted profiles of ISO 8601 dates and times (albeit with inconsistent lexical representations). This document formalizes those profiles and their lexical representation through reference to the datatypes defined in XML Schema Part 2 [3].

2 Terminology

2.1 Time Terms

The following acronyms and characters are used herein to represent time-related concepts:

Term	Definition
CCYY	four-digit year portion of Date
MM	two-digit month portion of Date
DD	two-digit day portion of Date
-	ISO 8601 separator among Date portions
T	ISO 8601 separator between Date and Time
hh	two-digit hour portion of Time (00 through 23)
mm	two-digit minutes portion of Time (00 through 59)
ss	two-digit seconds portion of Time (00 through 59)
:	ISO 8601 separator among Time portions
.	ISO 8601 separator between seconds and milliseconds
sss	fractional second addendum to Time (MAY contain any number of digits)
TZD	Time Zone Definition (either "Z" for UTC or "(+|-)hh:mm" for a specific time zone)

3 Profiles

Three profiles are defined herein.

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[1]ISO 8601: Representation of Dates and Times (2000). This specification is not freely available; however, a good summary is located at <http://www.cl.cam.ac.uk/~{}mgk25/iso-time.html>.

[2]The concept of an ISO 8601 profile is used in both RFC 3339 (http://www.ietf.org/rfc/rfc3339.txt) and a W3C Note (http://www.w3.org/TR/NOTE-datetime).

[3]XML Schema Part 2: Datatypes <http://www.w3.org/TR/xmlschema-2/>.

3.1 Date

The Date profile defines a date without including the time of day. The lexical representation is as follows:

```
CCYY-MM-DD
```

This profile is equivalent to the 'date' datatype defined in XML Schema [4]. When an XML schema is used to define an XMPP protocol extension that uses this profile, the datatype MUST be an XML Schema 'date'. If there are differences between the description in this document and those in XML Schema, the latter overrule.

Listing 1: The date of American independence

```
1776-07-04
```

3.2 DateTime

The DateTime profile is used to specify a non-recurring moment in time to an accuracy of seconds (or, optionally, fractions of a second). The format is as follows:

```
CCYY-MM-DDThh:mm:ss[.sss]TZD
```

The Time Zone Definition is mandatory and MUST be either UTC (denoted by addition of the character 'Z' to the end of the string) or some offset from UTC (denoted by addition of '[+|-]' and 'hh:mm' to the end of the string). The fractions of a second are optional and MAY be ignored if included (although an XMPP protocol extension using the DateTime profile MAY require the fractions of a second).

This profile is equivalent to the 'dateTime' datatype defined in XML Schema [5]. When an XML schema is used to define a Jabber protocol that uses this profile, the datatype MUST be an XML Schema 'dateTime'. If there are differences between the description in this document and those in XML Schema, the latter overrule.

Listing 2: Datetime of the first human steps on the Moon (UTC)

```
1969-07-21T02:56:15Z
```

Listing 3: Datetime of the first human steps on the Moon (Houston time)

```
1969-07-20T21:56:15-05:00
```

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[4]The 'date' datatype is defined at <http://www.w3.org/TR/xmlschema-2/#date>.

[5]The 'dateTime' datatype is defined at <http://www.w3.org/TR/xmlschema-2/#dateTime>.

3.3 Time

The Time profile is used to specify an instant of time that recurs (e.g., every day). The lexical representation is as follows:

```
hh:mm:ss[.sss][TZD]
```

The Time Zone Definition is optional; if included, it MUST be either UTC (denoted by addition of the character 'Z' to the end of the string) or some offset from UTC (denoted by addition of '[+|-]' [6] and 'hh:mm' to the end of the string). The fractions of a second are optional and MAY be ignored if included (although a Jabber protocol using the DateTime profile MAY require the fractions of a second).

This profile is equivalent to the 'time' datatype defined in XML Schema [7]. When an XML schema is used to define a Jabber protocol that uses this profile, the datatype MUST be an XML Schema 'time'. If there are differences between the description in this document and those in XML Schema, the latter overrule.

Listing 4: Time for tea
```
16:00:00
```

4 Migration

Some existing Jabber protocols use a different lexical representation for datetimes than the representation defined in XML Schema and specified by this document. These are Legacy Entity Time (XEP-0090) [8] (superseded by Entity Time (XEP-0202) [9]), Legacy Delayed Delivery (XEP-0091) [10] (superseded by Delayed Delivery (XEP-0203) [11]), and Jabber-RPC (XEP-0009) [12]. (The representation of dates in vcard-temp (XEP-0054) [13] matches that specified herein.) These older protocols represent datetimes as follows:

```
CCYYMMDDThh:mm:ss
```

---

[6] Inclusion of the '+' character means that the time in that zone is ahead of UTC; e.g., a Time Zone Definition of "+07:00" means that if the UTC time is 12:00 then the local time is 19:00 (typically this is true of an area that is east of 0° degrees latitude and west of 180° latitude, such as Bangkok, Thailand). Inclusion of the '-' character means that the time in that zone is behind UTC; e.g., a Time Zone Definition of "-07:00" means that if the UTC time is 12:00 then the local time is 05:00 (typically this is true of an area that is west of 0° degrees latitude and east of 180° latitude, such as Denver, Colorado, USA).

[7] The 'time' datatype is defined at <http://www.w3.org/TR/xmlschema-2/#time>.

[8] XEP-0090: Legacy Entity Time <http://xmpp.org/extensions/xep-0090.html>.

[9] XEP-0202: Entity Time <http://xmpp.org/extensions/xep-0202.html>.

[10] XEP-0091: Legacy Delayed Delivery <http://xmpp.org/extensions/xep-0091.html>.

[11] XEP-0203: Delayed Delivery <http://xmpp.org/extensions/xep-0203.html>.

[12] XEP-0009: Jabber-RPC <http://xmpp.org/extensions/xep-0009.html>.

[13] XEP-0054: vcard-temp <http://xmpp.org/extensions/xep-0054.html>.

The primary standard notation recommended by ISO 8601 includes the separators ("-" for dates and ":" for times), although ISO 8601 allows omission of the separators for applications in which compactness is more important than human readability. It is arguable whether Jabber applications using 'jabber:iq:time' and 'jabber:x:delay' require such compactness, but these protocols are in wide use today and have been implemented using the format shown above. Therefore, applications receiving data in those namespaces SHOULD be liberal in what they accept by handling datetimes either in the "CCYYMMDDThh:mm:ss" format or in the lexical representation defined in XML Schema and specified by this document. Applications generating data in those namespaces SHOULD use the existing format ("CCYYMMDDThh:mm:ss"), and are effectively "grandfathered" with respect to the date and time formats defined herein. While eventually it would be good to deprecate the older datetime representation for these protocols, the schedule for such deprecation (if any) shall be specified in official XEPs for these older protocols.

Jabber-RPC is a special case, since the specification for XML-RPC [14] includes only one example for datetimes, which is of the format "CCYYMMDDThh:mm:ss". Apparently many implementations of XML-RPC have taken this lexical representation as canonical, and do not support any other representation; because Jabber-RPC normally provides an interface to software that is outside the Jabber network, it is prudent for Jabber-RPC implementations to generate dates in the format shown in the XML-RPC specification, not that defined in this document.

New protocols approved by the XMPP Standards Foundation MUST use the lexical representations defined in this document.

5   Implementation Notes

The 'date', 'dateTime', and 'time' datatypes defined in XML Schema address several "edge cases" such as dates before the year 0000 and after the year 9999, as well as odd timezones no longer in use; most Jabber applications can safely ignore these edge cases, since it is highly unlikely that a Jabber entity will generate such representations.

6   Security Considerations

The timezone specifier of a ISO 8601 encoded time can reveal a geographic location to some degree, if it's set to the local time of a user, and thus concerns users' privcacy. To avoid this issue developers are advised to convert local time to UTC before sending ISO 8601 encoded times into the XMPP network.

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[14]XML-RPC <http://www.xmlrpc.com/spec>.

7 IANA Considerations

This document requires no interaction with the Internet Assigned Numbers Authority (IANA) [15].

8 XMPP Registrar Considerations

This document requires no interaction with the XMPP Registrar [16].

9 Acknowledgements

Thanks to Matt Miller for his feedback.