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JSCalendar: Converting from and to iCalendar  
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## Abstract

This document provides an informational guideline for converting JSCalendar from and to iCalendar.

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Internet-Draft

JSCalendar

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## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">2</a>
<a href="#">1.1.</a>	Motivation . . . . .	<a href="#">2</a>
<a href="#">1.2.</a>	Scope and caveats . . . . .	<a href="#">3</a>
<a href="#">1.3.</a>	Notational Conventions . . . . .	<a href="#">3</a>
<a href="#">2.</a>	New iCalendar parameters . . . . .	<a href="#">3</a>
<a href="#">2.1.</a>	SUBSECOND parameter . . . . .	<a href="#">3</a>
<a href="#">3.</a>	JSEvent . . . . .	<a href="#">4</a>
<a href="#">4.</a>	JSTask . . . . .	<a href="#">4</a>
<a href="#">5.</a>	JSGroup . . . . .	<a href="#">5</a>
<a href="#">6.</a>	Common properties . . . . .	<a href="#">5</a>
<a href="#">6.1.</a>	Time properties and types . . . . .	<a href="#">8</a>
<a href="#">6.2.</a>	Locations . . . . .	<a href="#">9</a>
<a href="#">6.3.</a>	Participants . . . . .	<a href="#">10</a>
<a href="#">7.</a>	Custom properties . . . . .	<a href="#">12</a>
<a href="#">8.</a>	Security Considerations . . . . .	<a href="#">12</a>
<a href="#">9.</a>	IANA Considerations . . . . .	<a href="#">12</a>
<a href="#">10.</a>	Acknowledgments . . . . .	<a href="#">12</a>
<a href="#">11.</a>	References . . . . .	<a href="#">12</a>
<a href="#">11.1.</a>	Normative References . . . . .	<a href="#">12</a>
<a href="#">11.2.</a>	Informative References . . . . .	<a href="#">13</a>
	Authors' Addresses . . . . .	<a href="#">13</a>

[1.](#) Introduction[1.1.](#) Motivation

The JSCalendar [[draft-ietf-calext-jscalendar](#)] data format is used to represent calendar data, and is meant as an alternative to the widely deployed iCalendar [[RFC5545](#)] data format.

While new calendaring services and applications might use JSCalendar as their main data format to exchange calendaring data, they are likely to interoperate with services and clients that just support iCalendar. Similarly, existing calendaring data is stored in iCalendar format in databases and other calendar stores, and providers and users might want to represent this data also in JSCalendar. Lastly, some implementations might want to preserve custom iCalendar properties, that have no equivalent in JSCalendar when converting between these formats.

To facilitate these use cases, this document provides an

informational guide how to convert JSCalendar data from and to iCalendar.

## [1.2.](#) Scope and caveats

JSCalendar and iCalendar have a lot of semantics in common, but they are not interchangeable formats:

- o JSCalendar contains a richer data model to express calendar information such as event locations and participants; while future iCalendar extensions may allow a direct mapping, for now there may be no representation directly in iCalendar of some properties and these have been marked as implementation specific for mapping.
- o iCalendar may contain arbitrary, non-standardised data with custom properties/attributes. Translating these into JSCalendar is implementation specific.
- o iCalendar has some obsolete features that have been removed from JSCalendar due to not being useful and/or supported in the real world (e.g. custom email alerts to send to random people). Translating these may lose some of the original fidelity.
- o Implementations may use a custom property to store data that could not be mapped directly in either direction in the original or a custom format, however this is not interoperable.

Accordingly, this document does not standardize a canonical translation between iCalendar and JSCalendar, and implementations MUST NOT make any assumptions how iCalendar data is represented in JSCalendar by other systems.

## [1.3.](#) Notational Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

## [2.](#) New iCalendar parameters

## [2.1.](#) SUBSECOND parameter

Parameter name: SUBSECOND

Purpose: This parameter is used to define fractional seconds for time values and durations. SUBSECOND MUST NOT be used in date-time calculations or comparisons in iCalendar. It is meant to preserve time precision on time values and duration with sub-second precision, without increasing the time value range within iCalendar.

Description: This parameter MAY be specified on properties of type DATE-TIME or DURATION. The integral part of the float value MUST be zero. The value MUST NOT be negative. iCalendar implementations SHOULD ignore this parameter in date time arithmetic. Implementations MUST ignore presence of the SUBSECOND parameter on RECURRENCE-ID properties when determining recurrence overrides. If present on a RECURRENCE-ID property, its value MUST match the SUBSECOND parameter value on the DATE-TIME property that defines the reference point for the recurring instances.

Format Definition:

This parameter is defined by the following notation:

subsecond-param = float

Example: DTSTART;SUBSECOND=0.03:20190605T133015

## [3.](#) JSEvent

A JSEvent maps to the the iCalendar VEVENT component type [[RFC5545](#)]. The following tables maps the JSEvent-specific properties to iCalendar:

Property	iCalendar counterpart
duration	DURATION property. If the VEVENT contains a DTEND property, the this maps to the duration property as

	the time span between DTSTART and DTEND when converting the respective time points to the UTC time zone. Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
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Table 1: Mapping JSEvent properties

#### 4. JSTask

A JSTask object maps to the iCalendar VTOD0 component type [[RFC5545](#)]. The following tables maps the JSTask-specific properties to iCalendar:

Property	iCalendar counterpart
due	Maps to the DUE property. See <a href="#">Section 6.1</a> .
estimatedDuration	ESTIMATED-DURATION property in the RFC draft [ <a href="#">draft-apthorp-ical-tasks</a> ], or the DURATION property otherwise. Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
statusUpdatedAt	COMPLETED property. The JSTask status property MUST have value "completed". Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
progress	PARTSTAT and COMPLETED properties, including the definitions in the RFC draft [ <a href="#">draft-apthorp-ical-tasks</a> ].
status	STATUS property, including the definitions in the RFC draft [ <a href="#">draft-apthorp-ical-tasks</a> ].

Table 2: Mapping JSTask properties

## 5. JSGroup

A JSGroup maps to a iCalendar VCALENDAR containing VEVENT or VTOD0 components.

Property	iCalendar counterpart
entries	VEVENT and VTOD0 components embedded in a VCALENDAR component.
source	SOURCE property.

Table 3: Mapping JSGroup properties

## 6. Common properties

This section contains recommendations how to map JSCalendar from and to iCalendar. It lists all common JSCalendar object properties in alphabetical order.

Property	iCalendar counterpart
@type	Determined by the iCalendar component type: "jsevent" for VEVENT, "jstask" for VTOD0, "jsgroup" for VCALENDAR.
alerts	Each entry maps to a VALARM component. The action property maps to iCalendar ACTION, where both iCalendar "DISPLAY" and "AUDIO" values map to the "display" action. An EMAIL value maps to a JSCalendar "email" action. <code>_relativeTo_</code> and <code>_offset_</code> map to the TRIGGER property.

categories	CONCEPT property, defined in [ <a href="#">draft-ietf-calext-ical-relations</a> ].
color	COLOR property, as specified in [ <a href="#">RFC7986</a> ].
created	CREATED property. Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
description	DESCRIPTION property.
descriptionContentType	Implementation-specific.
excluded	EXDATE property. Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
freeBusyStatus	TRANSP property.
invitedBy	Implementation-specific.
keywords	CATEGORIES property, as specified in [ <a href="#">RFC7986</a> ].
links	ATTACH ([ <a href="#">RFC5545</a> ]), URL or IMAGE ([ <a href="#">RFC7986</a> ]) properties with URI value types map to the the Link <code>_href_</code> . The <code>FMTTYPE</code> parameter maps to <code>_type_</code> , the <code>SIZE</code> parameter to <code>_size_</code> . Mapping other properties is implementation-specific.

locale	LANGUAGE parameter of the SUMMARY or DESCRIPTION property.
localizations	Implementation-specific.
locations	See <a href="#">Section 6.2</a> .
method	METHOD property of the embedding

	VCALENDAR.
participants	See <a href="#">Section 6.3</a> .
priority	PRIORITY property.
privacy	CLASS property.
prodId	PRODID property.
recurrenceOverrides	RDATE and EXDATE properties, and any VEVENT or VTODO instances with a recurrence-id and same UID as the mapped main object. If the DTSTART property defines a SUBSECOND parameter, but the RECURRENCE-ID of a recurrence instance does not, then use the SUBSECOND parameter value of DTSTART to determine the recurrence override time stamp.
recurrenceRule	RRULE property. For all-day calendar objects, map the <code>_until_</code> property value to an iCalendar DATE (effectively removing the time component). To convert a DATE-typed UNTIL from iCalendar, set the time components of the <code>LocalDateTime</code> value to "23:59:59". If the iCalendar UNTIL value is a UTC date time, convert it to the local time in the <code>JSCalendar</code> calendar object time zone. To convert to iCalendar where the DTSTART or DUE property is of type DATE, omit the time component of the <code>LocalDateTime</code> value.
relatedTo	RELATED-TO property.
replyTo	An iCalendar ORGANIZER with a <code>mailto:</code> URI mapped to the "imip" method, or any other URI mapped to the "other" method. Mapping multiple methods is



sequence	SEQUENCE property.
showWithoutTime	Implementation-specific.
start	Maps to the DTSTART property. See <a href="#">Section 6.1</a> .
status	STATUS property.
timeZone	Maps to the TZID parameter. See Section 6.1.
timeZones	Each entry in the property maps to a VTIMEZONE in the embedding VCALENDAR component.
title	SUMMARY property.
uid	UID property.
updated	DTSTAMP and LAST-MODIFIED properties. Fractional seconds SHOULD be preserved with the SUBSECOND parameter.
useDefaultAlerts	Implementation-specific.
virtualLocations	See <a href="#">Section 6.2</a> .

Table 4: Translation between JSCalendar and iCalendar

### [6.1](#). Time properties and types

iCalendar defines two different time types, DATE and DATE-TIME, where the latter may occur in three forms (with local time, with UTC time, with local time and time zone reference). In contrast, JSCalendar does not define a distinct type for dates, and date times are defined with the LocalDateTime type only.

A JSCalendar time maps to the iCalendar DATE type if all of the following criteria apply:

- o The "start" ("due") property value has zero time, or is not set.
- o The "duration" ("estimatedDuration") property value has zero time, or is a multiple of days or weeks, or is not set.

- o The "timeZone" property value is null, or is not set.

For all other cases, the time maps to an iCalendar DATE-TIME:

- o With local time and time zone reference, if the "timeZone" property value is set and does not equal "Etc/UTC".
- o With UTC time, if the "timeZone" property value equals "Etc/UTC".
- o With local time, if the "timeZone" property value is null or not set.

Fractional seconds SHOULD be preserved with the SUBSECOND parameter.

## 6.2. Locations

The iCalendar counterpart for JSCalendar Location objects is the iCalendar [[RFC5545](#)] LOCATION property, or implementation-specific.

Property	iCalendar counterpart
coordinates	GEO property.
description	Implementation-specific.
linkIds	Implementation-specific.
name	LOCATION property value.
rel	Implementation-specific.
timeZone	Implementation-specific.
uri	The LOCATION ALTREP parameter.

Table 5: Mapping Location properties

The iCalendar counterpart for JSCalendar VirtualLocation objects is the iCalendar [[RFC7986](#)] CONFERENCE property.

Internet-Draft

JSCalendar

June 2019

Property	iCalendar counterpart
description	Implementation-specific.
name	LABEL parameter.
uri	CONFERENCE property value.

Table 6: Mapping virtualLocation properties

### [6.3.](#) Participants

The following table outlines translation of JSCalendar participants. An iCalendar ORGANIZER maps to both the replyTo property and a participant with role "owner". If an ATTENDEE with the same CAL-ADDRESS value exists, then it maps to the same participant as the ORGANIZER participant. Other participants map to ATTENDEEs.

Internet-Draft

JSCalendar

June 2019

Property	iCalendar counterpart
attendance	ROLE parameter values REQ-PARTICIPANT, OPT-PARTICIPANT and NON-PARTICIPANT.
delegatedFrom	DELEGATED-FROM parameter
delegatedTo	DELEGATED-TO parameter
email	EMAIL parameter, if defined. Otherwise the CAL-ADDRESS property value, if it is a mailto: URI.
expectReply	RSVP parameter
kind	CUTYPE parameter
linkIds	Implementation-specific.
locationId	Implementation-specific.
memberOf	MEMBER parameter
name	CN parameter
participationStatus	PARTSTAT parameter
roles	ROLE parameter.
scheduleSequence	SEQUENCE property of the participant's latest iMIP message

scheduleUpdated	DTSTAMP property of the participant's latest iMIP message
sendTo	A CAL-ADDRESS with a mailto: URI maps to the JSCalendar "imip" method, any other URI to the "other" method. Mapping multiple methods is implementation-specific.

Table 7: Mapping Participant properties

## 7. Custom properties

Mapping custom or unknown properties between JSCalendar and iCalendar is implementation-specific. Implementations might use vendor-extension properties, which could also serve as basis for discussion for a JSCalendar standard extension. Alternatively, an implementation could preserve iCalendar properties and components in JSCalendar by use of a vendor-extension property formatted as jCal [\[RFC7265\]](#) data.

## 8. Security Considerations

The same security considerations as for [\[draft-ietf-calext-jscalendar\]](#) apply.

## 9. IANA Considerations

None.

## 10. Acknowledgments

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