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JSCalendar: Converting from and to iCalendar
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Abstract

This document defines how to convert calendaring information between the JSCalendar and iCalendar data formats. It considers every JSCalendar and iCalendar element registered at IANA at the time of publication. It defines conversion rules for all elements that are common to both formats, as well as how convert arbitrary or unknown JSCalendar and iCalendar elements. This document updates RFC 5545 ("iCalendar") and jscalendarbis ("JSCalendar") by defining new properties and parameters for JSCalendar and iCalendar conversion.

Status of This Memo

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1. Introduction

1.1. Notational Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The ABNF definitions in this document use the notations of [RFC5234]. ABNF rules not defined in this document either are defined in [RFC5234] or [RFC5545].

1.2. Scope and Goals

This document outlines how to convert calendaring information between the iCalendar and JSCalendar data formats. It describes which elements are common to both, but also highlights where the two formats differ. For each common element, it defines a conversion rule and includes an example of how to convert that element. All iCalendar and JSCalendar elements currently registered at IANA are in scope, but not all of these elements are common to both formats.

For elements that have no counterpart in the other format, it is the goal of this document to define how to preserve them during conversion, but in general it is not the goal to achieve this by defining new standard elements. Instead, this document updates [RFC5545] and [jscalendarbis] by defining iCalendar and JSCalendar elements to preserve elements that have no equivalent in the other format. These conversion-specific properties are defined in Section 4.1.2 for iCalendar, and Section 5.1.1 for JSCalendar. Appendix A further outlines the discrepancies between the two formats.

1.3. How to Read the Examples

Later sections contain examples that illustrate how to convert between the iCalendar and JSCalendar data formats. The notation of these examples is such that their main points should be clear to the reader, but their contents can also be parsed for automated testing. The following sections define the notation for such examples.

1.3.1. iCalendar Examples

An iCalendar example contains either an extract or a complete representation of iCalendar data. It always represents an iCalendar object, even if the example only depicts non-VCALENDAR components or properties. The following rules apply:

* An example that only contains iCalendar properties implicitly represents a VEVENT component having these properties set and that is part of a VCALENDAR component.

* An example that only contains one or more VEVENT, VTODO, VJOURNAL, FREEBUSY or VTIMEZONE components implicitly represents a VCALENDAR component that contains them. An example that only contains one or more other components implicitly represents a VEVENT component having these components set and that is part of a VCALENDAR components.

* An example that only contains VEVENT or VTODO components implicitly represents a VCALENDAR component that contains them.

* An example that only contains a VCALENDAR component but no contained components implicitly represents a VCALENDAR component that contains a VEVENT component.

* Implicit components (those without a BEGIN and END, or omitted completely) are assumed to contain all mandatory properties with some value, but the actual value is irrelevant for the example.

Figure 1 contains three examples, all of which represent the same iCalendar data. In the first example, both the VEVENT component and VCALENDAR component are implicit. In the second example, only the VCALENDAR component and its mandatory properties are implicit. The third example depicts a complete VCALENDAR component, nothing is implicit.

```
SUMMARY:hello
```

```
BEGIN:VEVENT
DTSTAMP:20060102T030405Z
DTSTART:20060102T030405Z
SUMMARY:hello
UID:CC0A494A-6E07-4827-8294-0752DD1ECFA4
END:VEVENT
BEGIN:VCALENDAR
PRODID:-//FOO//bar//EN
VERSION:2.0
BEGIN:VEVENT
DTSTAMP:20060102T030405Z
DTSTART:20060102T030405Z
SUMMARY:hello
UID:CC0A494A-6E07-4827-8294-0752DD1ECFA4
END:VEVENT
END:VCALENDAR
```

Figure 1: Examples for implicit and explicit iCalendar component notation

A line containing just the value ... stands for any other properties that might be present in a component but are irrelevant for this example. This includes mandatory properties as described for implicit components, but the value ... does not represent a property in a component for which at least one same-named property is explicitly stated for that component in the example. The line ... at the end of the example additionally stands for any END content lines to complete components that started with BEGIN content lines, and any of their missing mandatory properties. Figure 2 illustrates this as an alternative representation for the examples of Figure 1.

```
BEGIN:VCALENDAR
BEGIN:VEVENT
SUMMARY:hello
...
```

Figure 2: Example for additional properties and component ENDs represented by ...

A line starting with a single space represents the continuation of a folded content line (Section 3.1 of [RFC5545]). Figure 3 illustrates this.

```
SUMMARY:he
 llo
```

Figure 3: Example for a folded content line

1.3.2. JSCalendar Examples

A JSCalendar example always represents a Group object, even if the example only depicts one of the Group entries or properties.

JSCalendar objects are depicted either explicitly or implicitly. An explicit JSCalendar object starts and ends with braces. An implicit JSCalendar object omits braces, it only consists of JSON name/value pairs, separated by comma.

An implicit JSCalendar object is assumed to be of type Event, unless it contains the @type property with a different value. It is assumed to contain all mandatory properties with some value; if they are not depicted, their actual value is irrelevant for the main point of the example.

Figure 4 illustrates this with multiple examples, all of which represent the same JSCalendar data. The first example contains an implicit JSCalendar object of type Event. The second example contains an implicit JSCalendar object with a @type property. The third example contains an explicit Event object but the Group object containing it is omitted. The fourth example contains the full Group object, nothing is omitted.

```
"title": "hello"
"@type": "Event",
"title": "hello"
{
  "@type": "Event",
  "title": "hello",
  "start": "2006-01-02T03:04:05",
  "timeZone": "Etc/UTC",
  "uid": "CC0A494A-6E07-4827-8294-0752DD1ECFA4",
  "updated": "2006-01-02T03:04:05Z"
}
{
  "@type": "Group",
  "entries": [
    {
      "@type": "Event",
      "title": "hello",
      "start": "2006-01-02T03:04:05",
      "timeZone": "Etc/UTC",
      "uid": "CC0A494A-6E07-4827-8294-0752DD1ECFA4",
      "updated": "2006-01-02T03:04:05Z"
    }
  ]
}
```

Figure 4: Examples for implicit and explicit JSCalendar object notation

A property with name "..." and value "" stands for additional properties that might be present in a JSCalendar object but are irrelevant for this example, including mandatory properties. The "..." property requires the "@type" property to be set. Figure 5 illustrates this as an alternative representation for the examples of Figure 4.

```
{
  "@type": "Event",
  "title": "hello",
  "...": ""
}
```

Figure 5: Example for additional properties represented by ...

1.4. Lossy versus Lossless Conversion

This document outlines how to convert iCalendar elements to JSCalendar elements, and the other way round. Many of these can be represented by standard elements in both formats, meaning that they are registered in the iCalendar and JSCalendar IANA registries and differ from the special-purpose elements introduced in Section 4 and Section 5. Still, a number of elements in either format have no standard counterpart in the other. When converting between between iCalendar and JSCalendar, implementations MAY choose to only convert elements that have standard element in the target format, or aim to preserve as many elements as possible.

When to choose between lossy and lossless conversion is implementation-specific. For example:

* For lossy conversion, an implementation that internally stores calendar data in JSCalendar format might only want to convert to a subset of iCalendar elements for iMIP scheduling [RFC6047]. In this case, it might not make use any of the conversion-specific iCalendar properties introduced in Section 4.

* For lossless conversion, an implementation that internally stores calendar data in iCalendar format might want to convert without loss to JSCalendar when updating calendar events with JMAP [jmap-calendars]. For that, it can use the conversion-specific properties defined in Section 5.

All the examples in this document illustrate lossless conversion, if not explicitly stated otherwise in the example.

2. Converting iCalendar to JSCalendar

2.1. General rules

2.1.1. iCalendar Objects

Section 3.4 of [RFC5545] allows for an iCalendar stream to contain one or more iCalendar objects. In contrast, this specification only defines conversion for streams consisting of a single iCalendar object. Converting streams of multiple iCalendar objects is implementation-specific. All following sections of this document use the terms "iCalendar object" and "VCALENDAR component" interchangeably.

The VCALENDAR component [RFC5545] (Section 3.4) converts to a Group object [jscalendarbis] (Section 2.3). Its properties convert as follows:

Name	Reference	Group property	See	Note
ATTACH	[RFC5545], Section 3.8.1.1	links	Section 2.3.3	
CATEGORIES	[RFC5545], Section 3.8.1.2	keywords	Section 2.3.6	
COLOR	[RFC7986], Section 5.9	color	Section 2.3.8	
CONCEPT	[RFC9253], Section 8.1	categories	Section 2.3.9	
CREATED	[RFC5545], Section 3.8.7.1	created	Section 2.3.12	
DESCRIPTION	[RFC5545], Section 3.8.1.5	description	Section 2.3.13	
IMAGE	[RFC7986], Section 5.10	links	Section 2.3.22	

LAST-MODIFIED	[RFC5545], Section 3.8.7.3	updated	Section 2.3.23	
LINK	[RFC9253], Section 8.2	links	Section 2.3.24	
METHOD	[RFC5545], Section 3.7.2	entries/*/method	Section 2.3.27	
NAME	[RFC7986], Section 5.1	title	Section 2.3.28	
PRODID	[RFC5545], Section 3.7.3	prodId, entries/*/prodId	Section 2.3.32	
SOURCE	[RFC7986], Section 5.8	source	Section 2.3.40	
UID	[RFC5545], Section 3.8.4.7	uid	Section 2.3.45	

Table 1: Properties of the VCALENDAR component

Its components convert as follows:

Name	Reference	Group property	See	Note
VEVENT	[RFC5545], Section 3.6.1	entries	Section 2.2.3	
VTODO	[RFC5545], Section 3.6.2	entries	Section 2.2.5	

Table 2: Components of the VCALENDAR component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Group object.

The order of elements in the "entries" property is implementation-specific, e.g. entries need not be in the same order as their source components in the iCalendar object.

The following example illustrates how to convert the VCALENDAR component:

```
BEGIN:VCALENDAR
UID:41aa02b6-42d0-4f45-8cb4-8b5075be2e14
BEGIN:VEVENT
...
{
  "@type": "Group",
  "entries": [
    {
      "...": "",
      "@type": "Event"
    }
  ],
  "uid": "41aa02b6-42d0-4f45-8cb4-8b5075be2e14",
  "...": ""
}
```

Figure 6: Converting the VCALENDAR component

2.1.2. Recurring Components

Components in an iCalendar object generally convert to distinct JSCalendar objects. For example, two VEVENT components with different UID property values in the same iCalendar object convert to two separate Event objects in the Group object's entries. As an exception to this rule, this does not apply to recurrence overrides, defined as follows.

A VEVENT (or VTODO) component is a recurrence override if it has the RECURRENCE-ID property set, and the iCalendar object contains a VEVENT (or VTODO) component that does not have the RECURRENCE-ID but the RRULE property set, and the UID property values of the two components are equal. The component without the RECURRENCE-ID property is in that case referred to as the "main component".

The main component converts to an entry in the Group object's entries property.

The recurrence override converts to the "recurrenceOverrides" property of the converted main component. Its RECURRENCE-ID property value converts to the key in the "recurrenceOverrides" property. The value of the "recurrenceOverrides" property at that key is a

PatchObject that transform the converted main component into the converted recurrence override. The recurrenceId and recurrenceIdTimeZone properties MUST NOT be set in the PatchObject.

The following example illustrates how to convert a main component and its recurrence override:

```
BEGIN:VCALENDAR
BEGIN:VEVENT
UID:F4257E1D-5461-4EF6-840F-9DFC653EB559
RRULE:FREQ=DAILY
DTSTART;TZID=Europe/Berlin:20240101T140000
...
END:VEVENT
BEGIN:VEVENT
UID:F4257E1D-5461-4EF6-840F-9DFC653EB559
RECURRENCE-ID;TZID=Europe/Berlin:20240202T140000
DTSTART;TZID=Europe/Berlin:20240202T160000
...
END:VEVENT
END:VCALENDAR
```

```
{
  "@type": "Group",
  "entries": [
    {
      "...": "",
      "@type": "Event",
      "recurrenceOverrides": {
        "2024-02-02T14:00:00": {
          "start": "2024-02-02T16:00:00"
        }
      },
      "recurrenceRule": {
        "@type": "RecurrenceRule",
        "frequency": "daily"
      },
      "start": "2024-01-01T14:00:00",
      "timeZone": "Europe/Berlin",
      "uid": "F4257E1D-5461-4EF6-840F-9DFC653EB559"
    }
  ],
  "...": ""
}
```

Figure 7: Converting VEVENT recurrence overrides

A VEVENT (or VTODO) component is a stand-alone recurrence instance if it has the RECURRENCE-ID property set and the iCalendar object does not contain its related main component. Each stand-alone recurrence instance converts to a distinct Event (or Task) object in the Group object's entries property. The recurrenceId property MUST be set, the "recurrenceIdTimeZone" property MUST be set if not "null".

The following example illustrates how to convert stand-alone recurrence instances:

```
BEGIN:VCALENDAR
BEGIN:VEVENT
UID:F4257E1D-5461-4EF6-840F-9DFC653EB559
RECURRENCE-ID;TZID=Europe/Berlin:20240202T140000
DTSTART;TZID=Europe/Berlin:20240202T160000
...
END:VEVENT
BEGIN:VEVENT
UID:F4257E1D-5461-4EF6-840F-9DFC653EB559
RECURRENCE-ID;TZID=Europe/Berlin:20240103T140000
DTSTART;TZID=Europe/Berlin:20240103T170000
...
END:VEVENT
END:VCALENDAR
{
  "@type": "Group",
  "entries": [
    {
      "...": "",
      "@type": "Event",
      "recurrenceId": "2024-02-02T14:00:00",
      "recurrenceIdTimeZone": "Europe/Berlin",
      "start": "2024-02-02T16:00:00",
      "timeZone": "Europe/Berlin",
      "uid": "F4257E1D-5461-4EF6-840F-9DFC653EB559"
    },
    {
      "...": "",
      "@type": "Event",
      "recurrenceId": "2024-01-03T14:00:00",
      "recurrenceIdTimeZone": "Europe/Berlin",
      "start": "2024-01-03T17:00:00",
      "timeZone": "Europe/Berlin",
      "uid": "F4257E1D-5461-4EF6-840F-9DFC653EB559"
    }
  ],
  "...": ""
}
```

Figure 8: Converting VEVENT recurrence instances

2.1.3. JSCalendar Ids

JSCalendar generally uses JSON objects to represent a collection of same-typed values. The keys are of type Id [jscalendarbis] (Section 1.4.1), the values are JSCalendar object types. If an iCalendar element converts to a value in such a collection then an implementation needs to choose an identifier as key.

If the JSID parameter (Section 4.2.1) or JSID property (Section 4.1.1) is set on a property or component, then its value MUST be used as key when converting that element from iCalendar to JSCalendar. In absence of the JSID parameter or property key generation is implementation-specific.

Some sections later in this document describe key generation schemes for specific iCalendar elements by making use of UUID Version 5 with SHA1 hash [RFC9562] (Section 5.5). The Namespace ID to generate such keys is "7f1e1965-ae73-4454-b088-232c90730ce2". These key generation schemes are not mandatory, nor is making use of that particular Namespace ID when using UUID Version 5 (UUIDv5) as keys.

Irrespective of the key generation scheme, all keys MUST be valid according to the definition of the Id type. For consistency, keys SHOULD be stable such that converting the same iCalendar data to JSCalendar multiple times produces the same keys.

2.1.4. Timezone identifiers

Converting temporal properties such as DTSTART, DTEND, and RECURRENCE-ID requires to not only determine the date and time of the property value, but also the timezone it references.

If the property value type is DATE [RFC5545] (Section 3.3.4) or DATE-TIME in FORM #1: DATE WITH LOCAL TIME [RFC5545] (Section 3.3.5) then the timezone identifier is the JSON null value in JSCalendar.

If the property value type is DATE-TIME in FORM #2: DATE WITH UTC TIME [RFC5545] (Section 3.3.5) then the timezone identifier is "Etc/UTC" in JSCalendar.

If the property value type is DATE-TIME in FORM #3: DATE WITH LOCAL TIME AND TIME ZONE REFERENCE [RFC5545] (Section 3.3.5) then the timezone identifier is determined by the TZID parameter value as follows:

If the TZID parameter value is equal to a name in the IANA Time Zone Database [TZDB] then the timezone identifier is that verbatim name. Otherwise, how to convert the TZID parameter value is implementation-specific: software libraries such as the International Components for Unicode (https://icu.unicode.org/) support converting Microsoft time zone names to IANA time zone identifiers. Alternatively, an implementation might determine the name of an IANA time zone which has identical time zone rules over the time span of the calendar object.

Implementations MAY preserve a TZID parameter set to a non-IANA timezone identifier and its related VTIMEZONE by use of the "convertedProperties" and "components" properties (see Section 5.1.1), but MUST NOT expect other implementations to consider them when processing the calendar object. See Figure 41 for an example.

2.1.5. DATE and DATE-TIME

iCalendar provides the DATE and DATE-TIME value types to distinguish date-only from date-time values. JSCalendar only supports date-time values.

When converting from iCalendar to JSCalendar, a property value of type DATE-TIME converts to either a LocalDateTime or UTCDateTime, depending on the JSCalendar property definition. A DATE value type converts to a LocalDateTime with zero time.

Section 3.2 defines which iCalendar value type to choose when converting from JSCalendar to iCalendar.

2.2. Components

2.2.1. PARTICIPANT

The PARTICIPANT component [RFC9073] (Section 7.1) in a VEVENT or VTODO component converts to a Participant object [jscalendarbis] (Section 4.4.5). The converted object is set in the "participants" property of the Event or Task object.

The key of the Participant object MUST be the value of the JSID property (Section 4.1.1), if set. If no JSID property but the CALENDAR-ADDRESS property is set, then the key MAY be a UUIDv5 generated from the property value (see Section 2.1.3). Otherwise, the key MAY be the UID property value. When converting to iCalendar, implementations MAY omit setting the JSID property if key matches the UUIDv5 of the CALENDAR-ADDRESS property value or the key matches the UID property, and the key is not part of a JSON pointer in any JSPTR parameter value.

Its properties convert as follows:

Name	Reference	Participant property	See	Note
ATTACH	[RFC5545], Section 3.8.1.1	links	Section 2.3.3	
CALENDAR-ADDRESS	[RFC9073], Section 6.4	calendarAddress	Section 2.3.5	
DESCRIPTION	[RFC5545], Section 3.8.1.5	description	Section 2.3.13	
LINK	[RFC9253], Section 8.2	links	Section 2.3.24	
STYLED-DESCRIPTION	[RFC9073], Section 6.5	description	Section 2.3.41	
SUMMARY	[RFC5545], Section 3.8.1.12	name	Section 2.3.42	

Table 3: Properties of the PARTICIPANT component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Participant object. This includes mandatory properties such as UID [RFC5545] (Section 3.8.4.7).

The following example illustrates how to convert the PARTICIPANT component:

```
BEGIN:PARTICIPANT
UID:47AD2E1C-49D4-45DF-BD83-8398ACC7D8E2
DESCRIPTION:A participant
...
END:PARTICIPANT
```

```
"participants": {
  "47AD2E1C-49D4-45DF-BD83-8398ACC7D8E2": {
    "@type": "Participant",
    "description": "A participant",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "participant",
      "properties": [
        [
          "uid",
          {},
          "text",
          "47AD2E1C-49D4-45DF-BD83-8398ACC7D8E2"
        ]
      ]
    }
  }
}
```

Figure 9: Converting the PARTICIPANT component

2.2.2. VALARM

The VALARM component [RFC5545] (Section 3.6.6) in a VEVENT or VTODO component converts to an Alert object [jscalendarbis] (Section 4.5.1). The converted object is set in the "alerts" property of the Event or Task object.

The key of the Alert object MUST be the value of the JSID property (Section 4.1.1), if set. Otherwise, the key MAY be the value of the UID property. When converting to iCalendar, implementations MAY omit setting the JSID property if the key matches the value of the UID property, and the key is not part of a JSON pointer in any JSPTR parameter value.

Its properties convert as follows:

Name	Reference	Alert property	See	Note
ACKNOWLEDGED	[RFC9074], Section 6.1	acknowledged	Section 2.3.1	
ACTION	[RFC5545], Section 3.8.6.1	action	Section 2.3.2	Only if ACTION is EMAIL or DISPLAY.
RELATED-TO	[RFC5545], Section 3.8.4.5	relatedTo	Section 2.3.35	
TRIGGER	[RFC5545], Section 3.8.6.3	trigger	Section 2.3.44	

Table 4: Properties of the VALARM component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Alert object. This includes mandatory properties such as ATTENDEE [RFC5545] (Section 3.8.4.1), DESCRIPTION [RFC5545] (Section 3.8.1.5), or SUMMARY [RFC5545] (Section 3.8.1.12).

The following example illustrates how to convert the VALARM component:

```
BEGIN:VALARM
UID:04DC2968-6468-4B92-BC09-5A17D7D3D4E
TRIGGER:-PT30M
ACTION:DISPLAY
DESCRIPTION:Breakfast meeting
END:VALARM
```

```
"alerts": {
  "04DC2968-6468-4B92-BC09-5A17D7D3D4E": {
    "@type": "Alert",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "valarm",
      "properties": [
        [
          "description",
          {},
          "text",
          "Breakfast meeting"
        ],
        [
          "uid",
          {},
          "text",
          "04DC2968-6468-4B92-BC09-5A17D7D3D4E"
        ]
      ]
    },
    "trigger": {
      "@type": "OffsetTrigger",
      "offset": "-PT30M"
    },
    "action": "display"
  }
}
```

Figure 10: Converting the VALARM component

2.2.3. VEVENT

The VEVENT component [RFC5545] (Section 3.6.1) converts to a Event object [jscalendarbis] (Section 2.1). Its properties convert as follows:

Name	Reference	Event property	See	Note
ATTACH	[RFC5545], Section 3.8.1.1	links	Section 2.3.3	
ATTENDEE	[RFC5545], Section 3.8.4.1	participants	Section 2.3.4	
CATEGORIES	[RFC5545], Section 3.8.1.2	keywords	Section 2.3.6	

CLASS	[RFC5545], Section 3.8.1.3	privacy	Section 2.3.7	
COLOR	[RFC7986], Section 5.9	color	Section 2.3.8	
CONCEPT	[RFC9253], Section 8.1	categories	Section 2.3.9	
CONFERENCE	[RFC7986], Section 5.11	virtualLocations	Section 2.3.10	
CREATED	[RFC5545], Section 3.8.7.1	created	Section 2.3.12	
DESCRIPTION	[RFC5545], Section 3.8.1.5	description	Section 2.3.13	
DTEND	[RFC5545], Section 3.8.2.2	duration, endTimeZone	Section 2.3.14	
DTSTAMP	[RFC5545], Section 3.8.7.2	updated	Section 2.3.15	
DTSTART	[RFC5545], Section 3.8.2.4	start	Section 2.3.16	
DURATION	[RFC5545], Section 3.8.2.5	duration	Section 2.3.18	
EXDATE	[RFC5545], Section 3.8.5.1	recurrenceOverrides	Section 2.3.20	
GEO	[RFC5545], Section 3.8.1.6	locations	Section 2.3.21	
IMAGE	[RFC7986], Section 5.10	links	Section 2.3.22	
LAST-MODIFIED	[RFC5545], Section 3.8.7.3	updated	Section 2.3.23	
LINK	[RFC9253], Section 8.2	links	Section 2.3.24	
LOCATION	[RFC5545], Section 3.8.1.7	locations	Section 2.3.25	

ORGANIZER	[RFC5545], Section 3.8.4.3	organizerCalendarAddress	Section 2.3.29	
PRIORITY	[RFC5545], Section 3.8.1.9	priority	Section 2.3.31	
RDATE	[RFC5545], Section 3.8.5.2	recurrenceOverrides	Section 2.3.33	
RECURRENCE-ID	[RFC5545], Section 3.8.4.4	recurrenceId	Section 2.3.34	
RELATED-TO	[RFC5545], Section 3.8.4.5	relatedTo	Section 2.3.35	
RRULE	[RFC5545], Section 3.8.5.3	recurrenceRule	Section 2.3.36	
SEQUENCE	[RFC5545], Section 3.8.7.4	sequence	Section 2.3.37	
SHOW-WITHOUT-TIME	[icaljscalexts], Section 4.2	showWithoutTime	Section 2.3.38	
STATUS	[RFC5545], Section 3.8.1.11	status	Section 2.3.39	
STYLED-DESCRIPTION	[RFC9073], Section 6.5	description	Section 2.3.41	
SUMMARY	[RFC5545], Section 3.8.1.12	title	Section 2.3.42	
TRANSP	[RFC5545], Section 3.8.2.7	freeBusyStatus	Section 2.3.43	
UID	[RFC5545], Section 3.8.4.7	uid	Section 2.3.45	

Table 5: Properties of the VEVENT component

Its components convert as follows:

Name	Reference	Event property	See	Note
VALARM	[RFC5545], Section 3.6.6	alerts	Section 2.2.2	

Table 6: Components of the VEVENT component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Event object.

VEVENT components with different UID property values in the same iCalendar object convert to different entries in the Group. They sort in the same order as in the VCALENDAR component.

The following example illustrates how to convert the VEVENT component:

```
BEGIN:VCALENDAR
BEGIN:VEVENT
UID:DE935D01-3DF7-4201-B61A-D77D05C8B21A
DTSTART:20060102T030405Z
...
END:VEVENT
BEGIN:VEVENT
UID:60BE3D6E-6383-473A-BCF1-3C43EA1FA571
...
END:VEVENT
END:VCALENDAR
```

```
{
  "...": "",
  "@type": "Group",
  "entries": [
    {
      "@type": "Event",
      "start": "2006-01-02T03:04:05",
      "timeZone": "Etc/UTC",
      "uid": "DE935D01-3DF7-4201-B61A-D77D05C8B21A",
      "...": ""
    },
    {
      "@type": "Event",
      "uid": "60BE3D6E-6383-473A-BCF1-3C43EA1FA571",
      "...": ""
    }
  ]
}
```

Figure 11: Converting the VEVENT component

2.2.4. VLOCATION

The VLOCATION component [RFC9073] (Section 7.2) in a VEVENT or VTODO component converts to a Location object [jscalendarbis] (Section 4.2.5). The converted object is set in the "locations" property of the Event or Task object.

The key of the Location object MUST be the value of the JSID property (Section 4.1.1), if set. Otherwise, the key MAY be the value of the UID property. When converting to iCalendar, implementations MAY omit setting the JSID property if the key matches the value of the UID property, and the key is not part of a JSON pointer in any JSPTR parameter value.

Its properties convert as follows:

Name	Reference	Location property	See	Note
ATTACH	[RFC5545], Section 3.8.1.1	links	Section 2.3.3	
COORDINATES	[icaljscalexts], Section 4.1	coordinates	Section 2.3.11	
GEO	[RFC5545], Section 3.8.1.6	coordinates	Section 2.3.21	
IMAGE	[RFC7986], Section 5.10	links	Section 2.3.22	
LINK	[RFC9253], Section 8.2	links	Section 2.3.24	
LOCATION-TYPE	[RFC9073], Section 6.1	locationTypes	Section 2.3.26	
NAME	[RFC7986], Section 5.1	name	Section 2.3.28	

Table 7: Properties of the VLOCATION component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Location object. This includes mandatory properties such as UID [RFC5545] (Section 3.8.4.7).

The following example illustrates how to convert the VLOCATION component:

```
BEGIN:VLOCATION
UID:4954DC22-5BD6-4E98-844D-0302982F54AC
NAME:The venue
STRUCTURED-DATA;VALUE=URI:
 http://dir.example.com/venues/big-hall.vcf
...
END:VLOCATION
```

```
"locations": {
  "4954DC22-5BD6-4E98-844D-0302982F54AC": {
    "@type": "Location",
    "name": "The venue",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "vlocation",
      "properties": [
        [
          "structured-data",
          {},
          "uri",
          "http://dir.example.com/venues/big-hall.vcf"
        ],
        [
          "uid",
          {},
          "text",
          "4954DC22-5BD6-4E98-844D-0302982F54AC"
        ]
      ]
    }
  }
}
```

Figure 12: Converting the VLOCATION component

2.2.5. VTODO

The VTODO component [RFC5545] (Section 3.6.2) converts to a Task object [jscalendarbis] (Section 2.2). Its properties convert as follows:

Name	Reference	Task property	See	Note
ATTACH	[RFC5545], Section 3.8.1.1	links	Section 2.3.3	
ATTENDEE	[RFC5545], Section 3.8.4.1	participants	Section 2.3.4	
CATEGORIES	[RFC5545], Section 3.8.1.2	keywords	Section 2.3.6	
CLASS	[RFC5545], Section 3.8.1.3	privacy	Section 2.3.7	
COLOR	[RFC7986], Section 5.9	color	Section 2.3.8	
CONCEPT	[RFC9253], Section 8.1	categories	Section 2.3.9	
CONFERENCE	[RFC7986], Section 5.11	virtualLocations	Section 2.3.10	
CREATED	[RFC5545], Section 3.8.7.1	created	Section 2.3.12	
DESCRIPTION	[RFC5545], Section 3.8.1.5	description	Section 2.3.13	
DTSTAMP	[RFC5545], Section 3.8.7.2	updated	Section 2.3.15	
DTSTART	[RFC5545], Section 3.8.2.4	start	Section 2.3.16	
DUE	[RFC5545], Section 3.8.2.3	due	Section 2.3.17	
DURATION	[RFC5545], Section 3.8.2.5	duration	Section 2.3.18	
ESTIMATED-DURATION	[ical-tasks], Section 12.1	estimatedDuration	Section 2.3.19	
EXDATE	[RFC5545], Section 3.8.5.1	recurrenceOverrides	Section 2.3.20	

GEO	[RFC5545], Section 3.8.1.6	locations	Section 2.3.21	
IMAGE	[RFC7986], Section 5.10	links	Section 2.3.22	
LAST-MODIFIED	[RFC5545], Section 3.8.7.3	updated	Section 2.3.23	
LINK	[RFC9253], Section 8.2	links	Section 2.3.24	
LOCATION	[RFC5545], Section 3.8.1.7	locations	Section 2.3.25	
ORGANIZER	[RFC5545], Section 3.8.4.3	organizerCalendarAddress	Section 2.3.29	
PERCENT-COMPLETE	[RFC5545], Section 3.8.1.8	percentComplete	Section 2.3.30	
PRIORITY	[RFC5545], Section 3.8.1.9	priority	Section 2.3.31	
RDATE	[RFC5545], Section 3.8.5.2	recurrenceOverrides	Section 2.3.33	
RECURRENCE-ID	[RFC5545], Section 3.8.4.4	recurrenceId	Section 2.3.34	
RELATED-TO	[RFC5545], Section 3.8.4.5	relatedTo	Section 2.3.35	
RRULE	[RFC5545], Section 3.8.5.3	recurrenceRule	Section 2.3.36	
SEQUENCE	[RFC5545], Section 3.8.7.4	sequence	Section 2.3.37	
SHOW-WITHOUT-TIME	[icaljscalexts], Section 4.2	showWithoutTime	Section 2.3.38	
STYLED-DESCRIPTION	[RFC9073], Section 6.5	description	Section 2.3.41	
SUMMARY	[RFC5545], Section 3.8.1.12	title	Section 2.3.42	

TRANSP	[RFC5545], Section 3.8.2.7	freeBusyStatus	Section 2.3.43	
UID	[RFC5545], Section 3.8.4.7	uid	Section 2.3.45	

Table 8: Properties of the VTODO component

Its components convert as follows:

Name	Reference	Task property	See	Note
VALARM	[RFC5545], Section 3.6.6	alerts	Section 2.2.2	

Table 9: Components of the VTODO component

Other properties or components MAY be converted to the "iCalendar" property (Section 5.1.1) of the Task object.

VTODO components with different UID property values in the same iCalendar object convert to different entries in the Group. They sort in the same order as in the VCALENDAR component.

The following example illustrates how to convert the VTODO component:

```
BEGIN:VCALENDAR
BEGIN:VTODO
UID:83C80482-806D-41C4-8029-E438F793005D
DUE:20060102T030405Z
...
{
  "...": "",
  "@type": "Group",
  "entries": [
    {
      "...": "",
      "@type": "Task",
      "due": "2006-01-02T03:04:05",
      "timeZone": "Etc/UTC",
      "uid": "83C80482-806D-41C4-8029-E438F793005D"
    }
  ]
}
```

Figure 13: Converting the VTODO component

2.3. Properties

2.3.1. ACKNOWLEDGED

The ACKNOWLEDGED property [RFC9074] (Section 6.1) in a VALARM component converts to the "acknowledged" property [jscalendarbis] (Section 4.5.1) of the Alert object.

The following example illustrates how to convert the ACKNOWLEDGED property:

```
BEGIN:VEVENT
BEGIN:VALARM
ACKNOWLEDGED:20241002T114703Z
...
"alerts": {
  "1204B2FA-E4A0-4335-B7CD-0DDC09C9B890": {
    "@type": "Alert",
    "acknowledged": "2024-10-02T11:47:03Z",
    "...": ""
  }
}
```

Figure 14: Converting the ACKNOWLEDGED property

2.3.2. ACTION

The ACTION property [RFC5545] (Section 3.8.6.1) in a VALARM component converts to the "action" property [jscalendarbis] (Section 4.5.1) of the Alert object.

Its values convert as follows:

iCalendar value	JSCalendar value
DISPLAY	display
EMAIL	email

Table 10: Values of the ACTION property

An ACTION property with value AUDIO or any other not listed in Table 10 does not convert to the "action" property. Instead, the property converts to the iCalendar/properties property (Section 5.1.1) of the Alert.

The following examples illustrate how to convert the ACTION property:

```
BEGIN:VEVENT
BEGIN:VALARM
ACTION:DISPLAY
...
```

```
"alerts": {
  "02E4CAD6-B7A7-4EE4-93A6-4AA5AFD080E2": {
    "@type": "Alert",
    "action": "display",
    "...": ""
  }
}
```

Figure 15: Converting the ACTION property for value DISPLAY

```
BEGIN:VEVENT
BEGIN:VALARM
ACTION:AUDIO
...
```

```
"alerts": {
  "FC529A2B-D10F-461D-BDCF-55C77BB4B933": {
    "@type": "Alert",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "valarm",
      "properties": [
        [
          "action",
          {},
          "text",
          "AUDIO"
        ]
      ]
    },
    "...": ""
  }
}
```

Figure 16: Converting the ACTION property for value AUDIO

2.3.3. ATTACH

The ATTACH property [RFC5545] (Section 3.8.1.1) in a VEVENT, VTODO, PARTICIPANT, VLOCATION, or VCALENDAR component converts to a Link object [jscalendarbis] (Section 1.4.11). The converted object is set in the "links" property of the Event, Task, Participant, Location, or Group object.

The key of the Link object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the ATTACH property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The ATTACH property value converts to the "href" property of the Link object. A value of type URI converts as-is. A value of type BINARY converts to a URI in the "data" URL scheme ([RFC2397]. If the FMTTYPE parameter is set on the ATTACH property, then the parameter value MUST be set in the "mediatype" part of the data URL.

The ATTACH property parameters convert as follows:

Name	Reference	Link Property	Note
FMTTYPE	[RFC5545], Section 3.2.8	contentType	
LABEL	[RFC7986], Section 6.4	title	
SIZE	[RFC8607], Section 4.1	size	

Table 11: Parameters of the ATTACH property

Remarks:

The following examples illustrate how to convert the ATTACH property:

```
ATTACH:https://example.com/foo.pdf
"links": {
  "245708bf-8e07-5d3b-a5da-2974a63c3b91": {
    "@type": "Link",
    "href": "https://example.com/foo.pdf"
  }
}
```

Figure 17: Converting the ATTACH property with URI value

```
ATTACH;ENCODING=BASE64;VALUE=BINARY;FMTTYPE=image/png:iVBORw
 0KGgoAAAANSUhEUgAAAAEAAAABAQAAAAA3bvkkAAAAAmJLR0QAAd2KE6QAA
 AAKSURBVAjXY2gAAACCAIHdQ2r0AAAAAElFTkSuQmCC
"links": {
  "7beac36a-9287-57cb-96ab-dd2fc91163a2": {
    "@type": "Link",
    "href": "
LR0QAAd2KE6QAAAAKSURBVAjXY2gAAACCAIHdQ2r0AAAAAElFTkSuQmCC",
    "contentType": "image/png",
    "...": ""
  }
}
```

Figure 18: Converting the ATTACH property with BINARY value

2.3.4. ATTENDEE

The ATTENDEE property [RFC5545] (Section 3.8.4.1) in a VEVENT or VTODO component converts to a Participant object [jscalendarbis] (Section 4.4.5). The converted object is set in the "participants" property of the Event or Task object. The property value converts to the calendarAddress property of the Participant object.

The key of the Participant object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the ATTENDEE property value and the key is not part of a JSON pointer in any JSPTR parameter value.

An ATTENDEE property and a PARTICIPANT component in the same iCalendar component convert to the same Participant object, if their converted calendarAddress property values are equal. How to deal with conflicting values is implementation-specific.

The ATTENDEE property parameters convert as follows:

Name	Reference	Participant Property	Note
CN	[RFC5545], Section 3.2.2	name	
CUTYPE	[RFC5545], Section 3.2.3	kind	ROOM converts to "location"
DELEGATED-FROM	[RFC5545], Section 3.2.4	delegatedFrom	
DELEGATED-TO	[RFC5545], Section 3.2.5	delegatedTo	
EMAIL	[RFC7986], Section 6.2	email	
MEMBER	[RFC5545], Section 3.2.11	memberOf	
PARTSTAT	[RFC5545], Section 3.2.12	participationStatus	
ROLE	[RFC5545], Section 3.2.16	roles	OWNER role defined in [icaljscalexts]
RSVP	[RFC5545], Section 3.2.17	expectReply	
SENT-BY	[RFC5545], Section 3.2.18	sentBy	

Table 12: Parameters of the ATTENDEE property

The PARTSTAT of an ATTENDEE property in a VTODO component converts not only to the "participationStatus" property of the Participant object, but also to its progress property if the PARTSTAT parameter value is specific for VTODO components:

PARTSTAT	Reference	participationStatus	progress
NEEDS-ACTION	[RFC5545], Section 3.2.12	needs-action	
ACCEPTED	[RFC5545], Section 3.2.12	accepted	
DECLINED	[RFC5545], Section 3.2.12	declined	
TENTATIVE	[RFC5545], Section 3.2.12	tentative	
DELEGATED	[RFC5545], Section 3.2.12	delegated	
COMPLETED	[RFC5545], Section 3.2.12	accepted	completed
IN-PROCESS	[RFC5545], Section 3.2.12	accepted	in-process
FAILED	[ical-tasks], Section 11.1	accepted	failed

Table 13: Converting the PARTSTAT parameter in a VTODO component to Participant properties

The following examples illustrate how to convert the ATTENDEE property:

```
ATTENDEE;RSVP=TRUE;PARTSTAT=TENTATIVE;CN=Henry Cabot:mailto:hcabot@example.com
ORGANIZER:mailto:organizer@example.com
```

```
  "participants": {
    "0b235cc4-f04d-5fc4-98a3-c066650b3fbf": {
      "@type": "Participant",
      "calendarAddress": "mailto:hcabot@example.com",
      "name": "Henry Cabot",
      "participationStatus": "tentative",
      "expectReply": true
    },
    "251d3e9f-d83f-534c-8c45-c2896c75670c": {
      "@type": "Participant",
      "calendarAddress": "mailto:organizer@example.com",
      "roles": {
        "owner": true
      }
    }
  },
  "organizerCalendarAddress": "mailto:organizer@example.com"
```

Figure 19: Converting the ATTENDEE property

```
BEGIN:PARTICIPANT
UID:6CF544E4-BBC7-45A2-97FF-DFD1908CCE40
CALENDAR-ADDRESS:mailto:foo@example.com
DESCRIPTION:some description
...
END:PARTICIPANT
ATTENDEE;RSVP=TRUE;PARTSTAT=TENTATIVE:mailto:foo@example.com
ORGANIZER:mailto:organizer@example.com
```

```
"participants": {
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "participationStatus": "tentative",
    "expectReply": true,
    "description": "some description",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "participant",
      "properties": [
        [
          "uid",
          {},
          "text",
          "6CF544E4-BBC7-45A2-97FF-DFD1908CCE40"
        ]
      ]
    },
    "...": ""
  },
  "251d3e9f-d83f-534c-8c45-c2896c75670c": {
    "@type": "Participant",
    "calendarAddress": "mailto:organizer@example.com",
    "...": ""
  }
},
"organizerCalendarAddress": "mailto:organizer@example.com"
```

Figure 20: Converting the ATTENDEE property and PARTICIPANT component

```
BEGIN:VTODO
ATTENDEE;RSVP=TRUE;PARTSTAT=COMPLETED:mailto:foo@example.com
ORGANIZER:mailto:organizer@example.com
...
```

```
   "@type": "Task",
   "participants": {
     "59eb121c-e8f2-558a-9049-ef750a5976bd": {
       "@type": "Participant",
       "calendarAddress": "mailto:foo@example.com",
       "participationStatus": "accepted",
       "progress": "completed",
       "expectReply": true,
       "...": ""
     },
     "251d3e9f-d83f-534c-8c45-c2896c75670c": {
       "@type": "Participant",
       "calendarAddress": "mailto:organizer@example.com",
       "...": ""
     }
   },
   "organizerCalendarAddress": "mailto:organizer@example.com"
```

Figure 21: Converting the ATTENDEE property with a VTODO-specific participation status

```
ATTENDEE;RSVP=TRUE:mailto:foo@example.com
ATTENDEE;ROLE=OWNER;RSVP=TRUE:mailto:bar@example.com
ORGANIZER:mailto:organizer@example.com
"participants": {
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "expectReply": true
  },
  "5b6f4fa0-3695-53a7-904b-d0a6f8bc326f": {
    "@type": "Participant",
    "calendarAddress": "mailto:bar@example.com",
    "expectReply": true,
    "roles": {
      "owner": true
    }
  }
},
"organizerCalendarAddress": "mailto:organizer@example.com"
```

Figure 22: Converting the ATTENDEE property with the OWNER role

2.3.5. CALENDAR-ADDRESS

The CALENDAR-ADDRESS property [RFC9073] (Section 6.4) in a PARTICIPANT component converts to the "calendarAddress" property [jmap-calendars] (Section 5.1.1) of the Participant object.

Implementations MAY preserve the fact that a Participant object's "calendarAddress" property converted from the CALENDAR-ADRESS property of a PARTICIPANT component, rather than an ATTENDEE property. In this case, they MUST add an entry for the "calendarAddress" property in the "iCalendar/convertedProperties" property of the Participant object.

The following example illustrates how to convert the CALENDAR-ADDRESS property:

```
BEGIN:PARTICIPANT
CALENDAR-ADDRESS:mailto:foo@example.com
UID:47AD2E1C-49D4-45DF-BD83-8398ACC7D8E2
...
END:PARTICIPANT
"participants": {
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "participant",
      "convertedProperties": {
        "calendarAddress": {
          "@type": "ICalProperty",
          "name": "calendar-address"
        }
      },
      "properties": [
        [
          "uid",
          {},
          "text",
          "47AD2E1C-49D4-45DF-BD83-8398ACC7D8E2"
        ]
      ]
    }
  }
}
```

Figure 23: Converting the CALENDAR-ADDRESS property

2.3.6. CATEGORIES

The CATEGORIES property [RFC5545] (Section 3.8.1.2) in a VEVENT, VTODO, or VCALENDAR component converts to the "keywords" property [jscalendarbis] (Section 4.2.10) of the Event, Task, or Group object.

The list of category values converts to a set of keywords. The values convert case-sensitively. All CATEGORIES properties in the same iCalendar component convert to the "keywords" property in the JSCalendar object.

The following example illustrates how to convert the CATEGORIES property:

```
CATEGORIES:Favorites
CATEGORIES:Meeting
"keywords": {
  "Favorites": true,
  "Meeting": true
}
```

Figure 24: Converting the CATEGORIES property

2.3.7. CLASS

The CLASS property [RFC5545] (Section 3.8.1.3) in a VEVENT or VTODO component converts to the "privacy" property [jscalendarbis] (Section 4.4.3) of the Event or Task object.

Its values convert as follows:

iCalendar value	JSCalendar value
PUBLIC	public
PRIVATE	private
CONFIDENTIAL	secret

Table 14: Values of the CLASS property

Any other value does not convert to the "class" property. Instead, the property converts to the iCalendar/properties property (Section 5.1.1) of the JSCalendar object.

The following example illustrates how to convert the CLASS property:

```
CLASS:PRIVATE
"privacy": "private"
```

Figure 25: Converting the CLASS property

2.3.8. COLOR

The COLOR property [RFC7986] (Section 5.9) in a VEVENT, VTODO, or VCALENDAR component converts to the "color" property [jscalendarbis] (Section 4.2.12) of the Event, Task, or Group object.

Its value converts verbatim.

The following examples illustrate how to convert the COLOR property:

```
COLOR:maroon
"color": "maroon"
```

Figure 26: Converting the COLOR property with color name

```
COLOR:#ffa07a
"color": "#ffa07a"
```

Figure 27: Converting the COLOR property with numeric value

2.3.9. CONCEPT

The CONCEPT property [RFC9253] (Section 8.1) in a VEVENT, VTODO, or VCALENDAR component converts to the "categories" property [jscalendarbis] (Section 4.2.11) of the Event, Task, or Group object.

The list of URI values converts to a set of URIs. Multiple occurrences of the CONCEPT property in the same iCalendar component convert to the same categories property in the JSCalendar object.

The following example illustrates how to convert the CONCEPT property:

```
CONCEPT:https://example.com/event-types/arts/music
CONCEPT:https://example.com/event-types/arts/literature
"categories": {
  "https://example.com/event-types/arts/music": true,
  "https://example.com/event-types/arts/literature": true
}
```

Figure 28: Converting the CONCEPT property

2.3.10. CONFERENCE

The CONFERENCE property [RFC7986] (Section 5.11) in a VEVENT or VTODO component converts to a VirtualLocation object [jscalendarbis] (Section 4.2.7). The converted object is set in the "virtualLocations" property of the Event or Task object. The property value converts to the "uri" property of the VirtualLocation object.

The key of the VirtualLocation object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the CONFERENCE property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The property value converts to the "uri" property of the VirtualLocation object.

Its parameters convert as follows:

Name	Reference	Property	Note
FEATURE	[RFC7986], Section 6.3	features	
LABEL	[RFC7986], Section 6.4	name	

Table 15: Parameters of the CONFERENCE property

The following example illustrates how to convert the CONFERENCE property:

```
CONFERENCE;VALUE=URI;FEATURE=AUDIO,VIDEO;
 LABEL="Web video chat, access code=76543"
 :https://chat.example.com/audio?id=123456
```

```
"virtualLocations": {
  "67e4a1e9-cffc-5bd4-9602-1a5dfc8e1626": {
    "@type": "VirtualLocation",
    "name": "Web video chat, access code=76543",
    "uri": "https://chat.example.com/audio?id=123456",
    "features": {
      "audio": true,
      "video": true
    }
  }
}
```

Figure 29: Converting the CONFERENCE property

2.3.11. COORDINATES

The COORDINATES property [icaljscalexts] (Section 4.1) in a VLOCATION component converts to the "coordinates" property [jscalendarbis] (Section 4.2.5) of the Location object.

The following example illustrates how to convert the COORDINATES property:

```
BEGIN:VEVENT
BEGIN:VLOCATION
COORDINATES;VALUE=URI:geo:48.198634,16.371648;crs=wgs84;u=40
...
"locations": {
  "B995322D-2C00-4DE0-8958-DB6687CF3DB3": {
    "@type": "Location",
    "coordinates": "geo:48.198634,16.371648;crs=wgs84;u=40",
    "...": ""
  }
}
```

Figure 30: Converting the COORDINATES property

2.3.12. CREATED

The CREATED property [RFC5545] (Section 3.8.7.1) in a VEVENT, VTODO, or VCALENDAR component converts to the "created" property [jscalendarbis] (Section 4.1.4) of the Event, Task, or Group object.

The following example illustrates how to convert the CREATED property:

```
CREATED:20240329T133000Z
"created": "2024-03-29T13:30:00Z"
```

Figure 31: Converting the CREATED property

2.3.13. DESCRIPTION

The DESCRIPTION property [RFC5545] (Section 3.8.1.5) in a VEVENT, VTODO, VCALENDAR, or PARTICIPANT component converts to the "description" property [jscalendarbis] (Section 4.2.2) of the Event, Task, Group, or Participant object, unless its DERIVED parameter value is TRUE.

If the DERIVED parameter value is TRUE, then the property does not convert to the "description" property. Instead, a non-derived STYLED-DESCRIPTION property is expected to contain the description. Implementations MAY preserve the property in the "iCalendar" property (Section 5.1.1).

The following example illustrates how to convert the DESCRIPTION property:

```
DESCRIPTION:Their pancakes are delicious\; they are fluffy and sweet.
"description": "Their pancakes are delicious; they are fluffy and sweet."
```

Figure 32: Converting the DESCRIPTION property

2.3.14. DTEND

The DTEND property [RFC5545] (Section 3.8.2.2) in a VEVENT component converts to the "duration" property [jscalendarbis] (Section 5.1.2) of the Event object.

If the value type of the DTEND property is DATE, then the duration is the number of days or weeks between the DTSTART and DTEND property values. If the value type is DATE-TIME, then the duration is the timespan between the DTSTART and DTEND property values when converted to UTC time.

If the timezone identifier (Section 2.1.4) of the DTEND property differs from that of the DTSTART property, then it converts to the "endTimeZone" property of the Event.

Implementations MAY preserve the fact that the duration got determined by the DTEND property. How to do this depends on the timezone identifiers of the DTSTART and DTEND properties: If the time zone identifiers are not equal, then the presence of the "endTimeZone" property implies that it converted from the DTEND property. If the time zone identifiers are equal, then implementations MAY set the "iCalendar" property (Section 5.1.1) in the Event object and there add an entry for the path "duration" in the "convertedProperties" property. The value MUST be an ICalProperty object with the "name" property set to "dtend".

The following examples illustrate how to convert the DTEND property:

```
DTSTART;TZID=Europe/Berlin:20241017T130000
DTEND;TZID=Asia/Bangkok:20241018T040000
"start": "2024-10-17T13:00:00",
"timeZone": "Europe/Berlin",
"duration": "PT10H",
"endTimeZone": "Asia/Bangkok"
```

Figure 33: Converting the DTEND property with different timezone

```
DTSTART;TZID=Australia/Melbourne:20241002T130000
DTEND;TZID=Australia/Melbourne:20241002T140000
"start": "2024-10-02T13:00:00",
"timeZone": "Australia/Melbourne",
"duration": "PT1H",
"iCalendar": {
  "@type": "ICalComponent",
  "name": "vevent",
  "convertedProperties": {
    "duration": {
      "@type": "ICalProperty",
      "name": "dtend"
    }
  }
}
```

Figure 34: Converting the DTEND property with same timezone

```
DTSTART;VALUE=DATE:20240102
DTEND;VALUE=DATE:20240107
```

```
   "start": "2024-01-02T00:00:00",
   "timeZone": null,
   "duration": "P5D",
   "showWithoutTime": true,
   "iCalendar": {
     "@type": "ICalComponent",
     "name": "vevent",
     "convertedProperties": {
       "duration": {
         "@type": "ICalProperty",
         "name": "dtend"
       }
     }
   }
```

Figure 35: Converting the DTEND property with DATE value type

2.3.15. DTSTAMP

The DTSTAMP property [RFC5545] (Section 3.8.7.2) in a VEVENT or VTODO component converts to the "updated" property [jscalendarbis] (Section 4.1.5) of the Event or Task object.

The following examples illustrate how to convert the DTSTAMP property:

```
BEGIN:VCALENDAR
METHOD:REPLY
BEGIN:VEVENT
DTSTAMP:20240304T132000Z
...
{
  "@type": "Group",
  "entries": [
    {
      "@type": "Event",
      "method": "reply",
      "updated": "2024-03-04T13:20:00Z",
      "...": ""
    }
  ],
  "...": ""
}
```

Figure 36: Converting the DTSTAMP property in a VEVENT component

2.3.16. DTSTART

The DTSTART property [RFC5545] (Section 3.8.2.4) in a VEVENT or VTODO component converts to the "start" property of the Event or Task object (Sections 5.1.1 and 5.2.2 of [jscalendarbis]).

See Section 2.1.5 how to convert DATE and DATE-TIME values.

For VEVENT and VTODO components, the timezone identifier (Section 2.1.4) of the DTSTART property converts to the "timeZone" property of the Event or Task object. In addition, if the value type of the DTSTART property is DATE, then the value of the "showWithoutTime" property [jscalendarbis] (Section 4.2.4) is "true".

The following examples illustrate how to convert the DTSTART property for the VEVENT and VTODO components.

```
DTSTART;TZID=Europe/Berlin:20240921T105302
"start": "2024-09-21T10:53:02",
"timeZone": "Europe/Berlin",
"showWithoutTime": false
```

Figure 37: Converting the DTSTART property with TZID parameter

```
DTSTART:20240921T105302Z
"start": "2024-09-21T10:53:02",
"timeZone": "Etc/UTC",
"showWithoutTime": false
```

Figure 38: Converting the DTSTART property with UTC time

```
DTSTART:20240921T105302
"start": "2024-09-21T10:53:02",
"timeZone": null,
"showWithoutTime": false
```

Figure 39: Converting the DTSTART property with floating time

```
DTSTART;VALUE=DATE:20240921
"start": "2024-09-21T00:00:00",
"timeZone": null,
"showWithoutTime": true
```

Figure 40: Converting the DTSTART property with value type DATE

```
DTSTART;TZID="W. Europe Standard Time":20241121T105302
```

```
"start": "2024-11-21T10:53:02",
"timeZone": "Europe/Berlin",
"iCalendar": {
  "@type": "ICalComponent",
  "name": "vevent",
  "convertedProperties": {
    "start": {
      "@type": "ICalProperty",
      "name": "dtstart",
      "parameters": {
        "tzid": "W. Europe Standard Time"
      }
    }
  }
}
```

Figure 41: Converting the DTSTART property with a non-IANA TZID parameter

2.3.17. DUE

The DUE property [RFC5545] (Section 3.8.2.3) in a VTODO component converts to the "due" property [jscalendarbis] (Section 5.2.1) of the Task object.

See Section 2.1.5 how to convert DATE and DATE-TIME values.

If the VTODO component does not contain a DTSTART property, then the timezone identifier (Section 2.1.4) of the DUE property converts to the "timeZone" property of the Task object. If it contains both the DUE and DTSTART properties and the timezone identifier of the DUE property differs from that of the DTSTART property, then the "due" date-time property value MUST be relative to the time zone of DTSTART.

If the value type of the DUE property is DATE, then the value of the "showWithoutTime" property [jscalendarbis] (Section 4.2.4) is "true".

The following examples illustrate how to convert the DUE property:

```
BEGIN:VTODO
DUE;TZID=Europe/Berlin:20240921T105302
"@type": "Task",
"due": "2024-09-21T10:53:02",
"timeZone": "Europe/Berlin",
"showWithoutTime": false
```

Figure 42: Converting the DUE property with TZID parameter

```
BEGIN:VTODO
DUE:20240921T105302Z
```

```
"@type": "Task",
"due": "2024-09-21T10:53:02",
"timeZone": "Etc/UTC",
"showWithoutTime": false
```

Figure 43: Converting the DUE property with UTC time

```
BEGIN:VTODO
DUE:20240921T105302
```

```
"@type": "Task",
"due": "2024-09-21T10:53:02",
"timeZone": null,
"showWithoutTime": false
```

Figure 44: Converting the DUE property with floating time

```
BEGIN:VTODO
DUE;VALUE=DATE:20240921
```

```
"@type": "Task",
"due": "2024-09-21T00:00:00",
"timeZone": null,
"showWithoutTime": true
```

Figure 45: Converting the DUE property with value type DATE

```
BEGIN:VTODO
DTSTART;VALUE=DATE:20250220
DUE;VALUE=DATE:20250221
```

```
"@type": "Task",
"start": "2025-02-20T00:00:00",
"due": "2025-02-21T00:00:00",
"showWithoutTime": true
```

Figure 46: Converting the DUE property with value type DATE in combination with DTSTART

2.3.18. DURATION

The DURATION property [RFC5545] (Section 3.8.2.5) in a VEVENT or VTODO component converts to the "duration" property [jscalendarbis] (Section 5.1.2) of the Event or Task object.

The following example illustrates how to convert the DURATION property:

```
DURATION:PT1H
```

```
"duration": "PT1H"
```

Figure 47: Converting the DURATION

2.3.19. ESTIMATED-DURATION

The ESTIMATED-DURATION property [ical-tasks] (Section 12.1) in a VTODO component converts to the "estimatedDuration" property [jscalendarbis] (Section 5.2.3) of the Task object.

The following example illustrates how to convert the ESTIMATED-DURATION property:

```
BEGIN:VTODO
ESTIMATED-DURATION:P2D
"@type": "Task",
"estimatedDuration": "P2D"
```

Figure 48: Converting the ESTIMATED-DURATION

2.3.20. EXDATE

The EXDATE property [RFC5545] (Section 3.8.5.1) in a VEVENT or VTODO component converts to a PatchObject value [jscalendarbis] (Section 1.4.9). The converted object is set in the "recurrenceOverrides" property of the Event or Task object.

The property value converts to the key in the "recurrenceOverrides" property value. See Section 2.1.5 how to convert DATE and DATE-TIME values. The date-time MUST be relative to the timezone identified by the "timeZone" property of the Event or Task. The PatchObject value MUST set the "excluded" member to "true" and MUST NOT set any other property.

The following example illustrates how to convert the EXDATE property:

```
DTSTART:20230101T130000Z
RRULE:FREQ=MONTHLY
EXDATE:20230801T130000Z
```

```
"start": "2023-01-01T13:00:00",
"timeZone": "Etc/UTC",
"recurrenceRule": {
  "@type": "RecurrenceRule",
  "frequency": "monthly"
},
"recurrenceOverrides": {
  "2023-08-01T13:00:00": {
    "excluded": true
  }
}
```

Figure 49: Converting the EXDATE property

2.3.21. GEO

A GEO property with the DERIVED parameter value "TRUE" does not convert to JSCalendar. For non-derived GEO properties, the following rules apply:

The GEO property [RFC5545] (Section 3.8.1.6) in a VEVENT or VTODO component converts to a Location object [jscalendarbis] (Section 4.2.5). If the VEVENT or VTODO component also contains the LOCATION property (Section 2.3.25), then the GEO and LOCATION properties convert to the same Location object. The converted object is set in the "locations" property of the Event or Task object.

The key of the Location object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the GEO property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The GEO property [RFC5545] (Section 3.8.1.6) in a VLOCATION component converts to the "coordinates" property [jscalendarbis] (Section 4.2.5) of the Location object.

The pair of FLOAT values converts to a URI with the "geo" scheme [RFC5870]. The first FLOAT value converts to the "coord-a" part of the URI, the second FLOAT value to the "coord-b" part. A preceding plus sign (+) of the FLOAT value MUST be omitted, a preceding minus sign (-) MUST be preserved. The optional "coord-c" part of the URI MUST be omitted.

Implementations MAY preserve the fact that the coordinates converted from a GEO property by setting the JSON pointer path to the "coordinates" property in the "iCalendar/convertedProperties" property. If the GEO property converted from a VEVENT or VTODO component, then the "iCalendar" property MUST be that of the Event or Task object, for the VLOCATION component it MUST be the "iCalendar" property of the Location object.

The following examples illustrate how to convert the GEO property.

```
GEO;JSID=loc1:45.5;-93.3
"locations": {
  "loc1": {
    "@type": "Location",
    "coordinates": "geo:45.5,-93.3"
  }
},
"iCalendar": {
  "@type": "ICalComponent",
  "name": "vevent",
  "convertedProperties": {
    "locations/loc1/coordinates": {
      "@type": "ICalProperty",
      "name": "geo"
    }
  }
}
```

Figure 50: Converting the GEO property in a VEVENT. The JSID parameter is set to simplify testing.

```
LOCATION;JSID=loc1:Taj Mahal
GEO;JSID=loc1:27.175;78.041944
```

```
  "locations": {
    "loc1": {
      "@type": "Location",
      "name": "Taj Mahal",
      "coordinates": "geo:27.175,78.041944",
      "...": ""
    }
  },
  "iCalendar": {
    "@type": "ICalComponent",
    "name": "vevent",
    "convertedProperties": {
      "locations/loc1/coordinates": {
        "@type": "ICalProperty",
        "name": "geo"
      }
    }
  }
```

Figure 51: Converting the GEO and LOCATION properties in a VEVENT. The JSID parameters are set to simplify testing.

```
BEGIN:VEVENT
BEGIN:VLOCATION
NAME:Eiffel Tower
GEO:48.858222;2.2945
...
"locations": {
  "8FC58765-4559-49BC-8718-A5E46FC433B9": {
    "@type": "Location",
    "name": "Eiffel Tower",
    "coordinates": "geo:48.858222,2.2945",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "vlocation",
      "convertedProperties": {
        "coordinates": {
          "@type": "ICalProperty",
          "name": "geo"
        }
      },
      "...": ""
    }
  }
}
```

Figure 52: Converting the GEO property in a VLOCATION

2.3.22. IMAGE

The IMAGE property [RFC7986] (Section 5.10) in a VEVENT, VTODO, VLOCATION, PARTICIPANT, or VCALENDAR component converts to a Link object [jscalendarbis] (Section 1.4.11). The converted object is set in the "links" property of the Event, Task, Location, Participant, or Group object.

The key of the Link object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the IMAGE property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The IMAGE property value converts to the "href" property of the Link object. A value of type URI converts as-is. See Section 2.3.3 how to convert a BINARY value.

Its parameters convert as follows:

Name	Reference	Property	Note
DISPLAY	[RFC7986], Section 6.1	display	
FMTTYPE	[RFC5545], Section 3.2.8	contentType	
LABEL	[RFC7986], Section 6.4	title	
SIZE	[RFC8607], Section 4.1	size	

Table 16: Parameters of the IMAGE property

The following example illustrates how to convert the IMAGE property:

```
IMAGE;VALUE=URI;DISPLAY=BADGE,THUMBNAIL;LABEL=An image;FMTTYPE=image/png:
 https://example.com/images/party.png
```

```
"links": {
  "2c42ac17-1eaf-5a75-a216-aef848785d79": {
    "@type": "Link",
    "href": "https://example.com/images/party.png",
    "display": {
      "badge": true,
      "thumbnail": true
    },
    "contentType": "image/png",
    "title": "An image"
  }
}
```

Figure 53: Converting the IMAGE property

2.3.23. LAST-MODIFIED

The LAST-MODIFIED property [RFC5545] (Section 3.8.7.3) in a VCALENDAR component converts to the "updated" property [jscalendarbis] (Section 4.1.5) of the Group object.

The LAST-MODIFIED property [RFC5545] (Section 3.8.7.3) in a VEVENT or VTODO component does _not_ convert to the "updated" property [jscalendarbis] (Section 4.1.5) of the Event or Task object. Implementations MAY instead preserve the LAST-MODIFIED property in the "iCalendar" property.

The following example illustrates how to convert the LAST-MODIFIED property:

```
BEGIN:VCALENDAR
LAST-MODIFIED:20240914T231257Z
...
"@type": "Group",
"updated": "2024-09-14T23:12:57Z"
```

Figure 54: Converting the IMAGE property

2.3.24. LINK

A LINK property [RFC9253] (Section 8.2) with value type URI in a VEVENT, VTODO, PARTICIPANT, VLOCATION, or VCALENDAR component converts to a Link object [jscalendarbis] (Section 1.4.11). The converted object is set in the "links" property of the Event, Task, Participant, Location, or Group object.

The key of the Link object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the LINK property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The LINK property value converts to the "href" property of the Link object.

The LINK property parameters convert as follows:

Name	Reference	Link Property	Note
FMTTYPE	[RFC5545], Section 3.2.8	contentType	
LABEL	[RFC7986], Section 6.4	title	
LINKREL	[RFC9253], Section 6.1	rel	

Table 17: Parameters of the LINK property

A LINK property with any other value type does not convert to a standard JSCalendar element. Implementations MAY convert it to the "iCalendar" property (Section 5.1.1).

The following example illustrates how to convert the LINK property:

```
LINK;LINKREL="https://example.com/linkrel/source";LABEL=Venue;VALUE=URI:
 https://example.com/events
"links": {
  "63023b12-fcf4-53fa-841d-8c1684b9f80b": {
    "@type": "Link",
    "href": "https://example.com/events",
    "title": "Venue",
    "rel": "https://example.com/linkrel/source"
  }
}
```

Figure 55: Converting the LINK property

2.3.25. LOCATION

The LOCATION property [RFC5545] (Section 3.8.1.7) in a VEVENT or VTODO component converts to a Location object [jscalendarbis] (Section 4.2.5), unless its DERIVED parameter value is TRUE. The converted object is set in the "locations" property of the Event or Task.

The key of the Location object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the LOCATION property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The LOCATION property value converts to the "title" property of the Location object.

If the calendar component contains multiple VLOCATION components, then the LOCATION property also converts to the "mainLocationId" property of the Event or Task object. If the LOCATION property does not have the DERIVED parameter set to TRUE, then the "mainLocationId" is set to the key of the Location object of the LOCATION property. If instead the LOCATION property is derived and its property value matches the NAME property value of a VLOCATION component, then the "mainLocationId" is the identifier of the Location object of that VLOCATION component.

The following example illustrates how to convert the LOCATION property:

```
LOCATION:Conference Room - F123\, Bldg. 002
"locations": {
  "adde7a5b-2fb5-52aa-b760-595ea9edb80a": {
    "@type": "Location",
    "name": "Conference Room - F123, Bldg. 002",
    "...": ""
  }
}
```

Figure 56: Converting the LOCATION property

The following example illustrates how to convert the LOCATION property and multiple VLOCATION components:

```
LOCATION;DERIVED=TRUE:Fred’s Bar
BEGIN:VLOCATION
UID:12D2B3EC-AC84-4B70-9EB6-CFE6AD5830B0
NAME:Fred’s Bar
LOCATION-TYPE:bar
...
END:VLOCATION
BEGIN:VLOCATION
UID:6B1C3968-38D2-46AF-B436-BF3F72D459D4
NAME:XYZ Parking
LOCATION-TYPE:parking
COORDINATES;VALUE=URI:geo:40.71427,-74.00597
...
END:VLOCATION
"locations": {
  "12D2B3EC-AC84-4B70-9EB6-CFE6AD5830B0": {
    "@type": "Location",
    "name": "Fred’s Bar",
    "locationTypes": {
      "bar": true
    },
    "...": ""
  },
  "6B1C3968-38D2-46AF-B436-BF3F72D459D4": {
    "@type": "Location",
    "name": "XYZ Parking",
    "locationTypes": {
      "parking": true
    },
    "coordinates": "geo:40.71427,-74.00597",
    "...": ""
  }
},
"mainLocationId": "12D2B3EC-AC84-4B70-9EB6-CFE6AD5830B0"
```

Figure 57: Converting the LOCATION property and multiple VLOCATION components

2.3.26. LOCATION-TYPE

The LOCATION-TYPE property [RFC9073] (Section 6.1) in a VLOCATION component converts to the "locationTypes" property [jscalendarbis] (Section 4.2.5) of the Location object.

The list of location type values converts to a set of location types. The values convert case-sensitively. All LOCATION-TYPE properties in the same VLOCATION convert to the "locationTypes" property in the Location object.

The following example illustrates how to convert the LOCATION-TYPE property:

```
BEGIN:VEVENT
BEGIN:VLOCATION
LOCATION-TYPE:hotel,restaurant
...
"locations": {
  "0EA3F99A-835E-49CC-970C-8A4707A4C076": {
    "@type": "Location",
    "locationTypes": {
      "hotel": true,
      "restaurant": true
    },
    "...": ""
  }
}
```

Figure 58: Converting the LOCATION property

2.3.27. METHOD

The METHOD property [RFC5545] (Section 3.7.2) in a VCALENDAR component converts to the "method" property [jscalendarbis] (Section 4.1.7) of all Event or Task objects that are listed in the Group object’s entries property.

The property value converts in lowercase.

The following example illustrates how to convert the METHOD property:

```
BEGIN:VCALENDAR
METHOD:REQUEST
BEGIN:VEVENT
...
{
  "@type": "Group",
  "entries": [
    {
      "@type": "Event",
      "method": "request",
      "...": ""
    }
  ],
  "...": ""
}
```

Figure 59: Converting the METHOD property

2.3.28. NAME

The NAME property [RFC7986] (Section 5.1) in a VLOCATION component converts to the "name" property of the Location [jscalendarbis] (Section 4.2.5) or Participant [jscalendarbis] (Section 4.4.5) object.

The NAME property [RFC7986] (Section 5.1) in a VCALENDAR component converts to the "title" property [jscalendarbis] (Section 4.2.1) of the Group object. If the LANGUAGE parameter is set, then the parameter value converts to the "locale" property [jscalendarbis] (Section 4.2.9) of the same object.

The following examples illustrate how to convert the NAME property:

```
BEGIN:VCALENDAR
NAME;LANGUAGE=de:Feiertage Deutschland 2025
...
```

```
{
  "@type": "Group",
  "title": "Feiertage Deutschland 2025",
  "locale": "de",
  "...": ""
}
```

Figure 60: Converting the NAME property in a VCALENDAR component

```
BEGIN:VEVENT
BEGIN:VLOCATION
NAME:Room B
...
END:VLOCATION
...
```

```
"locations": {
  "8DE8404B-3BFA-443F-92B4-C678AD0F67DB": {
    "@type": "Location",
    "name": "Room B",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "vlocation"
    }
  }
}
```

Figure 61: Converting the NAME property in the VLOCATION component

2.3.29. ORGANIZER

The ORGANIZER property [RFC5545] (Section 3.8.4.3) in a VEVENT or VTODO component converts to the "organizerCalendarAddress" property [jscalendarbis] (Section 4.4.4) of the Event or Task object.

It also converts to a Participant object in the "participants" property [jscalendarbis] (Section 4.4.5), if any of its parameters convert to a Participant object property (see Table 18), or if none of the ATTENDEE properties in the iCalendar component have the ROLE parameter set to "OWNER". The ORGANIZER property value converts to the "calendarAddress" property of the Participant, the "owner" role is set in Participant "roles" property.

The key of the Participant object MUST be the value of the JSID parameter (Section 4.2.1), if set. If no JSID parameter is set, then the key MAY be the UUIDv5 generated from the ORGANIZER property value (see Section 2.1.3). When converting to iCalendar, implementations MAY omit setting the JSID parameter if the key matches the UUIDv5 of the ORGANIZER property value and the key is not part of a JSON pointer in any JSPTR parameter value.

The ORGANIZER property parameters convert to the Participant object as follows:

Name	Reference	Property	Note
CN	[RFC5545], Section 3.2.2	name	
EMAIL	[RFC7986], Section 6.2	email	
SENT-BY	[RFC5545], Section 3.2.18	sentBy	

Table 18: Parameters of the ORGANIZER property

An ORGANIZER property, an ATTENDEE property, and a PARTICIPANT component in the same iCalendar component all convert to the same Participant object, if their converted calendarAddress property values are equal. How to deal with conflicting property values is implementation-specific.

The following examples illustrate how to convert the ORGANIZER property:

```
ORGANIZER:mailto:organizer@example.com
ATTENDEE;RSVP=TRUE:mailto:foo@example.com
```

```
"organizerCalendarAddress": "mailto:organizer@example.com",
"participants": {
  "251d3e9f-d83f-534c-8c45-c2896c75670c": {
    "@type": "Participant",
    "calendarAddress": "mailto:organizer@example.com",
    "roles": {
      "owner": true
    }
  },
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "expectReply": true,
    "...": ""
  }
}
```

Figure 62: Converting an ORGANIZER property

```
ORGANIZER;CN=Jane Doe:mailto:organizer@example.com
ATTENDEE;PARTSTAT=ACCEPTED;CN=Jane Doe:mailto:organizer@example.com
ATTENDEE;RSVP=TRUE;PARTSTAT=TENTATIVE:mailto:foo@example.com
```

```
"organizerCalendarAddress": "mailto:organizer@example.com",
"participants": {
  "251d3e9f-d83f-534c-8c45-c2896c75670c": {
    "@type": "Participant",
    "calendarAddress": "mailto:organizer@example.com",
    "name": "Jane Doe",
    "participationStatus": "accepted",
    "roles": {
      "owner": true
    }
  },
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "expectReply": true,
    "participationStatus": "tentative",
    "...": ""
  }
}
```

Figure 63: Converting an ORGANIZER and its related ATTENDEE property

```
ORGANIZER;CN=Jane Doe:mailto:organizer@example.com
ATTENDEE;ROLE=OWNER;RSVP=TRUE:mailto:foo@example.com
```

```
"organizerCalendarAddress": "mailto:organizer@example.com",
"participants": {
  "251d3e9f-d83f-534c-8c45-c2896c75670c": {
    "@type": "Participant",
    "calendarAddress": "mailto:organizer@example.com",
    "name": "Jane Doe",
    "roles": {
      "owner": true
    }
  },
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "expectReply": true,
    "roles": {
      "owner": true
    },
    "...": ""
  }
}
```

Figure 64: Converting an ORGANIZER property with CN parameter and another participant having the 'owner' role set

```
ORGANIZER:mailto:organizer@example.com
ATTENDEE;ROLE=OWNER;RSVP=TRUE:mailto:foo@example.com
"organizerCalendarAddress": "mailto:organizer@example.com",
"participants": {
  "59eb121c-e8f2-558a-9049-ef750a5976bd": {
    "@type": "Participant",
    "calendarAddress": "mailto:foo@example.com",
    "expectReply": true,
    "roles": {
      "owner": true
    },
    "...": ""
  }
}
```

Figure 65: Converting an ORGANIZER property with another participant having the 'owner' role set

2.3.30. PERCENT-COMPLETE

The PERCENT-COMPLETE property [RFC5545] (Section 3.8.1.8) in a VTODO component converts to the "percentComplete" property [jscalendarbis] (Section 5.2.4) of the Task object.

The following examples illustrate how to convert the PERCENT-COMPLETE property:

```
BEGIN:VCALENDAR
BEGIN:VTODO
PERCENT-COMPLETE:53
...
{
  "@type": "Group",
  "entries": [
    {
      "@type": "Task",
      "percentComplete": 53,
      "...": ""
    }
  ],
  "...": ""
}
```

Figure 66: Converting the PERCENT-COMPLETE property in a VTODO component

2.3.31. PRIORITY

The PRIORITY property [RFC5545] (Section 3.8.1.9) in a VEVENT or VTODO component converts to the "priority" property [jscalendarbis] (Section 4.4.1) of the Event or Task object.

The following example illustrates how to convert the PRIORITY property:

```
PRIORITY:3
"priority": 3
```

Figure 67: Converting the PRIORITY property

2.3.32. PRODID

The PRODID property [RFC5545] (Section 3.7.3) in a VCALENDAR component converts to the "prodId" property [jscalendarbis] (Section 4.1.3) of the Group object. Implementations MAY additionally convert it also to the "prodId" property of all Event or Task objects that are listed in the Group object's "entries" property.

The property value converts verbatim.

The following example illustrates how to convert the PRODID property:

```
BEGIN:VCALENDAR
PRODID:-//BAZ//bam//EN
BEGIN:VEVENT
...
```

```
{
  "@type": "Group",
  "prodId": "-//BAZ//bam//EN",
  "entries": [
    {
      "@type": "Event",
      "prodId": "-//BAZ//bam//EN",
      "...": ""
    }
  ],
  "...": ""
}
```

Figure 68: Converting the PRODID property

2.3.33. RDATE

A RDATE property [RFC5545] (Section 3.8.5.2) with value type DATE or DATE-TIME in a VEVENT or VTODO component converts to a PatchObject value [jscalendarbis] (Section 1.4.9). The converted object is set in the "recurrenceOverrides" property of the Event or Task object.

The property value converts to the key in the "recurrenceOverrides" property value. See Section 2.1.5 how to convert DATE and DATE-TIME values. The date-time MUST be relative to the timezone identified by the "timeZone" property of the Event or Task object. The PatchObject value MUST be an empty JSON object.

A RDATE property with value type PERIOD does not convert to a standard JSCalendar element. Implementations MAY convert it to the "iCalendar" property (Section 5.1.1) of the Event or Task object.

The following example illustrates how to convert the RDATE property:

```
DTSTART:20230101T130000Z
RRULE:FREQ=MONTHLY
RDATE:20230805T170000Z
```

```
"start": "2023-01-01T13:00:00",
"timeZone": "Etc/UTC",
"recurrenceRule": {
  "@type": "RecurrenceRule",
  "frequency": "monthly"
},
"recurrenceOverrides": {
  "2023-08-05T17:00:00": {}
}
```

Figure 69: Converting the RDATE property

2.3.34. RECURRENCE-ID

The RECURRENCE-ID property [RFC5545] (Section 3.8.4.4) in a VEVENT or VTODO component converts to the "recurrenceId" property [jscalendarbis] (Section 4.3.1) of the Event or Task object. The timezone identifier (Section 2.1.4) of the RECURRENCE-ID property converts to the "recurrenceIdTimeZone" property.

See Section 2.1.5 how to convert DATE and DATE-TIME values.

The RANGE parameter [RFC5545] (Section 3.2.13) does not convert to a standard JSCalendar element. Implementations MAY preserve it in the iCalendar (Section 5.1.1) property.

See Section 2.1.2 for further requirements and examples.

2.3.35. RELATED-TO

The RELATED-TO property [RFC5545] (Section 3.8.4.5) in a VEVENT, VTODO, or VALARM component converts to a Relation object [jscalendarbis] (Section 1.4.10). The converted object is set in the "relatedTo" property of the Event or Task object [jscalendarbis] (Section 4.1.2), or the Alert object [jscalendarbis] (Section 4.5.1).

The property value in a VEVENT or VTODO converts as-is to the id of the Relation object in the "relatedTo" property. The property value in a VALARM converts to the same value as the id of that Alert object, which represents the VALARM component having that property value set in the UID property. Any RELTYPE parameters convert to the "relation" property in that Relation object. The parameter values convert in lowercase.

The following examples illustrate how to convert the RELATED-TO property:

```
BEGIN:VEVENT
RELATED-TO;RELTYPE=CHILD:4E05861C-A0C9-46AC-9A66-760FC1E0E167
RELATED-TO:4120A9B1-1133-4AC0-9185-C4C8396048ED
...
"relatedTo": {
  "4E05861C-A0C9-46AC-9A66-760FC1E0E167": {
    "@type": "Relation",
    "relation": {
      "child": true
    }
  },
  "4120A9B1-1133-4AC0-9185-C4C8396048ED": {
    "@type": "Relation"
  }
}
```

Figure 70: Converting the RELATED-TO property in a VEVENT

```
BEGIN:VEVENT
...
BEGIN:VALARM
UID:8297C37D-BA2D-4476-91AE-C1EAA364F8E1
JSID:alert1
TRIGGER:-PT15M
DESCRIPTION:Event reminder
ACTION:DISPLAY
ACKNOWLEDGED:20210302T151514Z
END:VALARM
...
BEGIN:VALARM
UID:DE7B5C34-83FF-47FE-BE9E-FF41AE6DD097
JSID:alert2
TRIGGER;VALUE=DATE-TIME:20210302T152000Z
RELATED-TO;RELTYPE=SNOOZE:8297C37D-BA2D-4476-91AE-C1EAA364F8E1
DESCRIPTION:Event reminder
ACTION:DISPLAY
END:VALARM
...
"alerts": {
  "alert1": {
    "@type": "Alert",
    "trigger": {
      "@type": "OffsetTrigger",
      "offset": "-PT15M"
    },
    "acknowledged": "2021-03-02T15:15:14Z",
    "iCalendar": {
      "@type": "ICalComponent",
```

```
          "name": "valarm",
          "properties": [
            [
              "description",
              {},
              "text",
              "Event reminder"
            ],
            [
              "uid",
              {},
              "text",
              "8297C37D-BA2D-4476-91AE-C1EAA364F8E1"
            ]
          ]
        },
        "...": ""
      },
      "alert2": {
        "@type": "Alert",
        "trigger": {
          "@type": "AbsoluteTrigger",
          "when": "2021-03-02T15:20:00Z"
        },
        "relatedTo": {
          "alert1": {
            "@type": "Relation",
            "relation": {
              "snooze": true
            }
          }
        },
        "iCalendar": {
          "@type": "ICalComponent",
          "name": "valarm",
          "properties": [
            [
              "description",
              {},
              "text",
              "Event reminder"
            ],
            [
              "uid",
              {},
              "text",
              "DE7B5C34-83FF-47FE-BE9E-FF41AE6DD097"
            ]
```

```
        ]
      },
      "...": ""
    }
  }
```

Figure 71: Converting the RELATED-TO property in a VALARM

2.3.36. RRULE

The RRULE property [RFC5545] (Section 3.8.5.3) in a VEVENT or VTODO component converts to a RecurrenceRule object [jscalendarbis] (Section 4.3.3). The converted object is set in the "recurrenceRule" property of the Event or Task object.

The RECUR value type converts to a RecurrenceRule object as follows:

RRULE field	RecurrenceRule property
FREQ	frequency
UNTIL	until
COUNT	count
INTERVAL	interval
BYSECOND	bySecond
BYMINUTE	byMinute
BYHOUR	byHour
BYDAY	byDay
BYMONTHDAY	byMonthDay
BYYEARDAY	byYearDay
BYWEEKNO	byWeekNo
BYMONTH	byMonth
BYSETPOS	bySetPosition
WKST	firstDayOfWeek
RSCALE [RFC7529]	rscale
SKIP [RFC7529]	skip

Table 19: Converting the RECUR value type to a RecurrenceRule object

The string values of the FREQ, WKST, RSCALE convert to lowercase. The UNTIL part in a VEVENT or VTODO converts to a LocalDateTime value relative to the timezone of the Event or Task object.

The following example illustrates how to convert the RRULE property:

```
DTSTART;TZID=Europe/Berlin:20240101T010000
RRULE:FREQ=YEARLY
 ;INTERVAL=2
 ;BYMONTH=1
 ;BYDAY=SU
 ;BYHOUR=8,9
 ;BYMINUTE=30
 ;UNTIL=20240930T120000Z
"recurrenceRule": {
  "@type": "RecurrenceRule",
  "frequency": "yearly",
  "interval": 2,
  "byMonth": [
    "1"
  ],
  "byDay": [
    {
      "@type": "NDay",
      "day": "su"
    }
  ],
  "byHour": [
    8,
    9
  ],
  "byMinute": [
    30
  ],
  "until": "2024-09-30T14:00:00"
},
"start": "2024-01-01T01:00:00",
"timeZone": "Europe/Berlin"
```

Figure 72: Example for converting the RRULE property

2.3.37. SEQUENCE

The SEQUENCE property [RFC5545] (Section 3.8.7.4) in a VEVENT or VTODO component converts to the "sequence" property [jscalendarbis] (Section 4.1.6) of the Event or Task object.

The following example illustrates how to convert the SEQUENCE property:

```
SEQUENCE:3
"sequence": 3
```

Figure 73: Example for converting the SEQUENCE property

2.3.38. SHOW-WITHOUT-TIME

The SHOW-WITHOUT-TIME property [icaljscalexts] (Section 4.2) in a VEVENT or VTODO component converts to the "showWithoutTime" property [jscalendarbis] (Section 4.2.4) of the Event or Task object. As outlined in the definition of the SHOW-WITHOUT-TIME property, the property MUST be ignored if the temporal value type of the VEVENT or VTODO component is DATE, or if the property value is "FALSE".

The following example illustrates how to convert the SHOW-WITHOUT-TIME property:

```
DTSTART;TZID=America/Chicago:20250521T080000
DURATION:PT12H
SHOW-WITHOUT-TIME;VALUE=BOOLEAN:TRUE
```

```
"start": "2025-05-21T08:00:00",
"timeZone": "America/Chicago",
"duration": "PT12H",
"showWithoutTime": true
```

Figure 74: Example for converting the SHOW-WITHOUT-TIME property

2.3.39. STATUS

The STATUS property [RFC5545] (Section 3.8.1.11) in a VEVENT component converts to the "status" property [jscalendarbis] (Section 5.1.4) of the Event object. The STATUS property in a VTODO component converts to the "progress" property [jscalendarbis] (Section 5.2.5) of the Task object.

The property value converts in lowercase.

The following examples illustrate how to convert the STATUS property:

```
STATUS:TENTATIVE
```

```
"status": "tentative"
```

Figure 75: Example for converting the STATUS property in a VEVENT component

```
BEGIN:VTODO
STATUS:IN-PROCESS
...
```

```
{
  "@type": "Task",
  "progress": "in-process",
  "...": ""
}
```

Figure 76: Example for converting the STATUS property in a VTODO component

2.3.40. SOURCE

The SOURCE property [RFC7986] (Section 5.8) in a VCALENDAR component converts to the "source" property [jscalendarbis] (Section 5.3.2) of the Group object.

The following example illustrates how to convert the SOURCE property:

```
BEGIN:VCALENDAR
SOURCE;VALUE=URI:https://example.com/holidays.ics
...
{
  "@type": "Group",
  "source": "https://example.com/holidays.ics",
  "...": ""
}
```

Figure 77: Example for converting the SOURCE property

2.3.41. STYLED-DESCRIPTION

The STYLED-DESCRIPTION property [RFC9073] (Section 6.5) in a PARTICIPANT, VEVENT or VTODO component converts to the "description" property [jscalendarbis] (Section 4.2.2) of the Participant, Event or Task object under the following conditions:

* The property value type MUST be TEXT.

* The FMTTYPE parameter either MUST NOT be set, or its value MUST be a media type [RFC6838] with top-level type "text".

* Its DERIVED parameter value MUST NOT be TRUE. If the value is TRUE, then another property in the same component is expected to contain the description.

If these conditions are not met, implementations MAY preserve the property in the "iCalendar" property (Section 5.1.1).

Its parameters convert as follows:

Name	Reference	Property	Note
FMTTYPE	[RFC5545], Section 3.2.8	descriptionContentType	

Table 20: Parameters of the STYLED-DESCRIPTION property

The following example illustrates how to convert the STYLED-DESCRIPTION property:

```
STYLED-DESCRIPTION;VALUE=TEXT;FMTTYPE=text/html:
 <!DOCTYPE html><html><body>hello\,<b>world</b></body></html>
"description": "<!DOCTYPE html><html><body>hello,<b>world</b></body></html>",
"descriptionContentType": "text/html"
```

Figure 78: Converting the STYLED-DESCRIPTION property

2.3.42. SUMMARY

The SUMMARY property [RFC5545] (Section 3.8.1.12) in a VEVENT or VTODO component converts to the "title" property [jscalendarbis] (Section 4.2.1) of the Event or Task object. If the LANGUAGE parameter is set, then the parameter value converts to the "locale" property [jscalendarbis] (Section 4.2.9) of the same object.

The SUMMARY property [RFC5545] (Section 3.8.1.12) in a PARTICIPANT component converts to the "name" property [jscalendarbis] (Section 4.2.5) of the Participant object.

The following examples illustrate how to convert the SUMMARY property:

```
SUMMARY:Birthday Party
"title": "Birthday Party"
```

Figure 79: Converting the SUMMARY property in a VEVENT

```
SUMMARY;LANGUAGE=fr:F棚te d’anniversaire
"title": "F棚te d’anniversaire",
"locale": "fr"
```

Figure 80: Converting the SUMMARY property with LANGUAGE parameter in a VEVENT

```
BEGIN:VEVENT
BEGIN:PARTICIPANT
SUMMARY:John
...
"participants": {
  "858DA9AE-695B-43CD-BA4E-294C945356BC": {
    "@type": "Participant",
    "name": "John",
    "...": ""
  }
}
```

Figure 81: Converting the SUMMARY property in a PARTICIPANT

2.3.43. TRANSP

The TRANSP property [RFC5545] (Section 3.8.2.7) in a VEVENT or VTODO component converts to the "freeBusyStatus" property [jscalendarbis] (Section 4.4.2) of the Event or Task object.

Its values convert as follows:

iCalendar value	JSCalendar value
OPAQUE	busy
TRANSPARENT	free

Table 21: Values of the TRANSP property

The following example illustrates how to convert the TRANSP property:

```
TRANSP:TRANSPARENT
"freeBusyStatus": "free"
```

Figure 82: Converting the TRANSP property

2.3.44. TRIGGER

The TRIGGER property [RFC5545] (Section 3.8.6.3) in a VALARM component converts to either an AbsoluteTrigger or OffsetTrigger object. The converted object is set in the "trigger" property [jscalendarbis] (Section 4.5.1) of the Alert object.

A property of value type DURATION converts an OffsetTrigger object. The property value converts to its offset property. A value of type DATE-TIME converts to an AbsoluteTrigger object. The property value converts to its when property.

Its parameters convert as follows:

Name	Reference	Property	Note
RELATED	[RFC5545], Section 3.2.14	relativeTo	If VALUE=DURATION

Table 22: Parameters of the TRIGGER property

The following examples illustrate how to convert the TRIGGER property:

```
BEGIN:VEVENT
...
BEGIN:VALARM
TRIGGER;RELATED=END:PT5M
...
```

```
"alerts": {
  "2D3D674B-E3E4-4C63-BBF5-4582ED49BCB7": {
    "@type": "Alert",
    "trigger": {
      "@type": "OffsetTrigger",
      "offset": "PT5M",
      "relativeTo": "end"
    },
    "...": ""
  }
}
```

Figure 83: Converting the TRIGGER property to an OffsetTrigger

```
BEGIN:VEVENT
...
BEGIN:VALARM
TRIGGER;VALUE=DATE-TIME:20250302T010203Z
...
```

```
"alerts": {
  "6AB751CF-515B-4925-9B8D-5AA2185F3E64": {
    "@type": "Alert",
    "trigger": {
      "@type": "AbsoluteTrigger",
      "when": "2025-03-02T01:02:03Z"
    },
    "...": ""
  }
}
```

Figure 84: Converting the TRIGGER property to an AbsoluteTrigger

2.3.45. UID

The UID property [RFC5545] (Section 3.8.4.7) in a VEVENT, VTODO, or VCALENDAR component converts to the "uid" property [jscalendarbis] (Section 4.1.1) of the Event, Task, or Group object.

The following example illustrates how to convert the UID property:

```
UID:5ACEA86F-40CF-47EE-9CCA-7C85588A589F
"uid": "5ACEA86F-40CF-47EE-9CCA-7C85588A589F"
```

Figure 85: Converting the UID property

3. Converting JSCalendar to iCalendar

3.1. Alert

The Alert object [jscalendarbis] (Section 4.5.1) converts to a VALARM component (Section 2.2.2). Its properties convert as follows:

Name	Reference	Property (or other)	See
acknowledged	[jscalendarbis], Section 4.5.1	ACKNOWLEDGED	Section 2.3.1
action	[jscalendarbis], Section 4.5.1	ACTION	Section 2.3.2
relatedTo	[jscalendarbis], Section 4.5.1	RELATED-TO	Section 2.3.35, and remarks below
trigger	[jscalendarbis], Section 4.5.1	TRIGGER	Section 2.3.44

Table 23: Properties of the Alert object

Remarks:

* The value of the RELATED-TO property is the UID property value of that VALARM component, to which the related Alert object converts to. Consequently, the UID property for such a VALARM MUST be set, otherwise the UID property MAY be set.

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the VALARM component.

3.2. Event and Task

The Event object [jscalendarbis] (Section 2.1) converts to a VEVENT component (Section 2.2.3), the Task object [jscalendarbis] (Section 2.2) converts to a VTODO component (Section 2.2.5).

In the iCalendar component, the value data types of the DTSTART, DUE and RECURRENCE-ID properties all MUST be of the same form, either DATE, or DATE WITH LOCAL TIME, or DATE WITH UTC TIME (see Section 3.3.5 of [RFC5545]). It MUST be DATE if the "showWithoutTime" property value is "true", the "timeZone" property value is null, and the time component is zero in the values of the "start", due", "duration", "estimatedDuration", "recurrenceId" properties, and the "until" property of the RecurrenceRule object, and in any key of the "recurrenceOverrides" property value. Otherwise, it MAY be DATE WITH UTC TIME if the "timeZone" property value is "Etc/UTC" and the "endTimeZone" property value is null. It MUST be DATE WITH LOCAL TIME in all other cases.

The following table defines how to convert properties that are common to both the Event and Task object types. Table 25 and Table 26 later in this section define how to convert properties specific to either Event or Task objects.

Name	Reference	Property (or other)	See
alerts	[jscalendarbis], Section 4.5.1	VALARM (component)	Alert object (Section 3.1)
categories	[jscalendarbis], Section 4.2.11	CONCEPT	Section 2.3.9
color	[jscalendarbis], Section 4.2.12	COLOR	Section 2.3.8
created	[jscalendarbis], Section 4.1.4	CREATED	Section 2.3.12
description	[jscalendarbis], Section 4.2.2	DESCRIPTION, or STYLED-DESCRIPTION	Section 2.3.13, Section 2.3.41, and remarks below
descriptionContentType	[jscalendarbis], Section 4.2.3	FMTTYPE (parameter) of STYLED-DESCRIPTION	Section 2.3.41, and remarks below
freeBusyStatus	[jscalendarbis], Section 4.4.2	TRANSP	Section 2.3.43
keywords	[jscalendarbis], Section 4.2.10	CATEGORIES	Section 2.3.6
links	[jscalendarbis], Section 4.2.8	ATTACH, or other	Link object (Section 3.4)
locale	[jscalendarbis], Section 4.2.9	LANGUAGE (parameter) of SUMMARY	Section 2.3.42, Section

		property	2.3.13, Section 2.3.41
locations	[jscalendarbis], Section 4.2.5	LOCATION, GEO, or VLOCATION (component)	Location object (Section 3.5)
mainLocationId	[jscalendarbis], Section 4.2.6	LOCATION	Location object (Section 3.5)
method	[jscalendarbis], Section 4.1.7	METHOD of iCalendar object	Section 2.3.27, and Group object (Section 3.3)
organizerCalendarAddress	[jscalendarbis], Section 4.4.4	ORGANIZER	Section 2.3.29
participants	[jscalendarbis], Section 4.4.5	ATTENDEE, or PARTICIPANT (component)	Participant object (Section 3.6)
priority	[jscalendarbis], Section 4.4.1	PRIORITY	Section 2.3.31
privacy	[jscalendarbis], Section 4.4.3	CLASS	Section 2.3.7
prodId	[jscalendarbis], Section 4.1.3	PRODID of iCalendar object	Section 2.3.32, and Group object (Section 3.3)
progress	[jscalendarbis], Section 5.2.5	STATUS	Section 2.3.39
recurrenceId	[jscalendarbis], Section 4.3.1	RECURRENCE-ID	Section 2.3.34

recurrenceIdTimeZone	[jscalendarbis], Section 4.3.2	TZID (parameter) of RECURRENCE-ID	Section 2.3.34
recurrenceOverrides	[jscalendarbis], Section 4.3.4	RDATE, EXDATE or recurrence override component	Section 2.1.2, and remarks below
recurrenceRule	[jscalendarbis], Section 4.3.3	RRULE	Section 2.3.36
relatedTo	[jscalendarbis], Section 4.1.2	RELATED-TO	Section 2.3.35
sequence	[jscalendarbis], Section 4.1.6	SEQUENCE	Section 2.3.37
showWithoutTime	[jscalendarbis], Section 4.2.4	SHOW-WITHOUT-TIME	Section 2.3.38, and remarks below
timeZone	[jscalendarbis], Section 4.6.1	TZID (parameter) of DTSTART and DUE	Section 2.3.16, Section 2.3.17
title	[jscalendarbis], Section 4.2.1	SUMMARY	Section 2.3.42
uid	[jscalendarbis], Section 4.1.1	UID	Section 2.3.45
updated	[jscalendarbis], Section 4.1.5	DTSTAMP, and LAST-MODIFIED	Section 2.3.15, Section 2.3.23
virtualLocations	[jscalendarbis], Section 4.2.7	CONFERENCE	Section 2.3.10

Table 24: Properties of the Event and Task object

Remarks:

* The "descriptionContentType" property value determines if the "description" property converts to the DESCRIPTION or STYLED-DESCRIPTION property. A description of content type "text/plain" converts to the DESCRIPTION property. Any other description converts to the STYLED-DESCRIPTION property, in which case a plain text version of the rich-text description MAY be set additionally in the DESCRIPTION property, having its DERIVED parameter set to "TRUE". How to derive plain text from rich-text is implementation-specific.

* The entries in the "recurrenceOverrides" property convert depending on the contents of the PatchObject value. A PatchObject that sets the "excluded" member to "true" converts to an EXDATE property for the date-time of that recurrence instance. An empty PatchObject converts to an RDATE property. Any other PatchObject converts to a recurrence override component in the embedding VCALENDAR component.

* The "showWithoutTime" property only converts to the SHOW-WITHOUT-TIME property if the value data type of the DTSTART or DUE properties is of form DATE WITH UTC TIME or DATE WITH LOCAL TIME.

Properties specific to the Event object type convert to iCalendar properties as follows:

Name	Reference	Property (or other)	See
duration	[jscalendarbis], Section 5.1.2	DURATION, or DTEND	Section 2.3.18, Section 2.3.14
endTimeZone	[jscalendarbis], Section 5.1.3	TZID parameter of DTEND	Section 2.3.14, Section 2.3.17
start	[jscalendarbis], Section 5.1.1,	DTSTART	Section 2.3.16
status	[jscalendarbis], Section 5.1.4	STATUS	Section 2.3.39

Table 25: Properties of the Event object

Properties specific to the Task object type convert to iCalendar properties as follows:

Name	Reference	Property (or other)	See
due	[jscalendarbis], Section 5.2.1	DUE	Section 2.3.17
estimatedDuration	[jscalendarbis], Section 5.2.3	ESTIMATED-DURATION	Section 2.3.19
percentComplete	[jscalendarbis], Section 5.2.4	PERCENT-COMPLETE	Section 2.3.30
progress	[jscalendarbis], Section 5.2.5	STATUS	Section 2.3.39
start	[jscalendarbis], Section 5.2.2,	DTSTART	Section 2.3.16

Table 26: Properties of the Task object

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the VEVENT or VTODO component.

3.3. Group

The Group object [jscalendarbis] (Section 2.3) converts to a VCALENDAR component (Section 2.1.1). Its properties convert as follows:

Name	Reference	Property (or other)	See
categories	[jscalendarbis], Section 4.2.11	CONCEPT	Section 2.3.9
color	[jscalendarbis], Section 4.2.12	COLOR	Section 2.3.8
created	[jscalendarbis], Section 4.1.4	CREATED	Section 2.3.12
description	[jscalendarbis], Section 4.2.2	DESCRIPTION, or STYLED-DESCRIPTION	Section 2.3.13,

			Section 2.3.41, and remarks below
entries	[jscalendarbis], Section 5.3.1	VEVENT or VTODO (component)	Event and Task object (Section 3.2), and remarks below
keywords	[jscalendarbis], Section 4.2.10	CATEGORIES	Section 2.3.6
links	[jscalendarbis], Section 4.2.8	ATTACH, or other	Link object (Section 3.4)
locale	[jscalendarbis], Section 4.2.9	LANGUAGE (parameter) of either NAME, or DESCRIPTION (in order of preference)	Section 2.3.28, Section 2.3.13
prodId	[jscalendarbis], Section 4.1.3	PRODID	Section 2.3.32, and remarks below
source	[jscalendarbis], Section 5.3.2	SOURCE	Section 2.3.40
title	[jscalendarbis], Section 4.2.1	NAME	Section 2.3.28
uid	[jscalendarbis], Section 4.1.1	UID	Section 2.3.45
updated	[jscalendarbis], Section 4.1.5	LAST-MODIFIED	Section 2.3.23

Table 27: Properties of the Group object

Remarks:

* The "descriptionContentType" property value determines if the "description" property converts to the DESCRIPTION or STYLED-DESCRIPTION property. A description of content type "text/plain" converts to the DESCRIPTION property. Any other description converts to the STYLED-DESCRIPTION property, in which case a plain text version of the rich-text description MAY be set additionally in the DESCRIPTION property, having its DERIVED parameter set to "TRUE". How to derive plain text from rich-text is implementation-specific.

* The prodId property value of the Group object is expected to be equal to the "prodId" property value of all the Group entries. They all convert to the same, single PRODID property in the VCALENDAR component. How to convert unequal prodId property values is implementation-specific.

* The method property value in all the Group entries is expected to be equal. How to convert entries with unequal method property values is implementation-specific.

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the VCALENDAR component.

3.4. Link

The Link object [jscalendarbis] (Section 1.4.11) converts either an ATTACH property (Section 2.3.3) or an IMAGE property (Section 2.3.22). Which iCalendar property to choose is implementation-specific. As a guideline:

* Choose the iCalendar property name indicated in the iCalendar (Section 5.1.1) of the JSCalendar object that contains this Link object, if set.

* Choose IMAGE, if the "display" property is set.

* Choose LINK, if the "rel" property is set.

* Choose ATTACH otherwise.

The href property converts to the "iCalendar" property value. The other Link properties convert as follows:

Name	Reference	Parameter (or other)	See
contentType	[jscalendarbis], Section 1.4.11	FMTTYPE	Section 2.3.3
display	[jscalendarbis], Section 1.4.11	DISPLAY	Section 2.3.22, and remarks below
rel	[jscalendarbis], Section 1.4.11	LINKREL	Section 6.1 of [RFC9253]
size	[jscalendarbis], Section 1.4.11	SIZE	Section 2.3.3
title	[RFC7986], Section 6.4	LABEL	Section 2.3.3

Table 28: Properties of the Link object

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the same component to which the Link object converts to as a property.

3.5. Location

The Location object [jscalendarbis] (Section 4.2.5) converts to either a LOCATION (Section 2.3.25) or GEO (Section 2.3.21) property, or it converts to a VLOCATION component (Section 2.2.4). Which iCalendar element to choose is implementation-specific. As a guideline:

* If the "iCalendar" property on the Location object is set, or the parent JSCalendar object contains an entry for that Location in the "convertedProperties" property of its "iCalendar" property, then convert the object back to the named iCalendar component or property.

* Choose LOCATION if the key of the Location object in the "locations" property matches the "mainLocationId" property, or if the "name" property is set and the iCalendar component does not already contain a LOCATION property. The "name" property converts to the LOCATION property value.

* Choose the VLOCATION component otherwise.

Implementations MAY convert one of the Location objects to both a VLOCATION component and the LOCATION and GEO properties of the component that contains the VLOCATION component. In this case, the DERIVED parameter MUST be set on the LOCATION and GEO properties with value "TRUE".

The properties convert to a VLOCATION component as follows:

Name	Reference	Property (or other)	See
coordinates	[jscalendarbis], Section 4.2.5	COORDINATES	Section 2.3.11, Section 2.3.21
links	[jscalendarbis], Section 4.2.8	ATTACH, or other	Link object (Section 3.4)
locationTypes	[jscalendarbis], Section 4.2.5	LOCATION-TYPE	Section 2.3.26
name	[jscalendarbis], Section 4.2.5	NAME	Section 2.3.28

Table 29: Properties of the Location object

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the VLOCATION component, or the component which the Location converts to as a property.

3.6. Participant

The Participant object [jscalendarbis] (Section 4.4.5) converts to an ATTENDEE property (Section 2.3.4) and PARTICIPANT component (Section 2.2.1), unless it is fully represented by the ORGANIZER property (Section 2.3.29):

* It if fully represented by the ORGANIZER property if its "calendarAddress" property value matches the "organizerCalendarAddress" property value, and it does not have any role but the "owner" role set, and it only has properties set that convert to ORGANIZER parameters (see Table 18).

* Otherwise, it converts to an ATTENDEE property if the "calendarAddress" property is set. The "calendarAddress" converts to the ATTENDEE property value.

* It converts to a PARTICIPANT component if any of the Participant properties in Table 31 are set. If the Participant object also converts to an ATTENDEE property, then the CALENDAR-ADDRESS property value of the PARTICIPANT component MUST match the ATTENDEE property value.

The following Participant properties convert to parameters of the ATTENDEE property. How to convert these if the Participant "calendarAddress" property is not set is implementation-specific.

Name	Reference	Parameter (or other)	See
delegatedFrom	[jscalendarbis], Section 4.4.5	DELEGATED-FROM	Section 2.3.4
delegatedTo	[jscalendarbis], Section 4.4.5	DELEGATED-TO	Section 2.3.4
email	[jscalendarbis], Section 4.4.5	EMAIL	Section 2.3.4, and remarks below
expectReply	[jscalendarbis], Section 4.4.5	RSVP	Section 2.3.4
kind	[jscalendarbis], Section 4.4.5	CUTYPE	Section 2.3.4
memberOf	[jscalendarbis], Section 4.4.5	MEMBER	Section 2.3.4
name	[jscalendarbis], Section 4.4.5	CN	Section 2.3.4, and remarks below
participationStatus	[jscalendarbis], Section 4.4.5	PARTSTAT	Section 2.3.4

progress	[jscalendarbis], Section 4.4.5	PARTSTAT	Section 2.3.4, and remarks below
roles	[jscalendarbis], Section 4.4.5	ROLE	Section 2.3.4, and remarks below
sentBy	[jscalendarbis], Section 4.4.5	SENT-BY	Section 2.3.4, and remarks below

Table 30: Properties of the Participant object that convert to the ATTENDEE property

Remarks:

* The "owner" role needs not convert to the ROLE parameter of the ATTENDEE property if the Participant object converts to both the ATTENDEE and ORGANIZER property.

* The "name", "email" and "sentBy" properties also convert to parameters of the ORGANIZER property, if the Participant converts to the ORGANIZER property.

* The progress property converts to the PARTSTAT parameter as outlined in Table 13.

The following Participant properties convert to the PARTICIPANT component:

Name	Reference	Property (or other)	See
description	[jscalendarbis], Section 4.4.5	DESCRIPTION, or STYLED-DESCRIPTION	Section 2.3.13, Section 2.3.41, and remarks below
descriptionContentType	[jscalendarbis], Section 4.4.5	FMTTYPE (parameter) of STYLED-DESCRIPTION	Section 2.3.41
links	[jscalendarbis], Section 4.2.7	ATTACH, or other	Link object (Section 3.4)
name	[jscalendarbis], Section 4.4.5	SUMMARY	Section 2.3.42
percentComplete	[jscalendarbis], Section 4.4.5	PERCENT-COMPLETE	Section 2.3.30

Table 31: Properties of the Participant object that convert to the PARTICIPANT component

Other properties MAY be converted to JSPROP properties (Section 4.1.2) in the PARTICIPANT component, or the component which the Participant converts to as a property.

3.7. VirtualLocation

The VirtualLocation object [jscalendarbis] (Section 4.2.7) converts to a CONFERENCE property (Section 2.3.10).

The "uri" property converts to the CONFERENCE property value.

The following properties convert to parameters of the CONFERENCE property:

Name	Reference	Parameter (or other)	See
features	[jscalendarbis], Section 4.2.7	FEATURE	Section 2.3.10
name	[jscalendarbis], Section 4.2.7	LABEL	Section 2.3.10

Table 32: Properties of the VirtualLocation object

4. Updates to iCalendar

4.1. New Properties

4.1.1. JSID

Property Name:
JSID

Purpose:
This property preserves the identifier of a JSCalendar object value in iCalendar.

Value type:
TEXT; also see "Format Definition" below for value restrictions.

Property Parameters:
IANA and non-standard property parameters can be specified on this property.

Conformance:
This property can be specified at most once in any calendar component.

Description:
This property specifies the JSON object key of the JSCalendar object to which an iCalendar component converts to. For example, this property set in a VALARM component within a VEVENT component defines the key of the Alert object value in the Event object's "alerts" property (see Figure 86).

The value of the JSID property MUST be a valid object key according to the definition of the JSCalendar property to which the component converts to.

Format Definition:

This property is defined by the following notation:

```
jsid-prop = "JSID" *(";" other-param) ":" TEXT CRLF
```

Example(s):
The following example illustrates how to convert the JSID property set in a VALARM component.

```
BEGIN:VEVENT
...
BEGIN:VALARM
UID:52DFB000-3C49-4577-8003-3086001BD26A
JSID:myalert
...
END:VALARM
"@type": "Event",
"alerts": {
  "myalert": {
    "@type": "Alert",
    "iCalendar": {
      "@type": "ICalComponent",
      "name": "valarm",
      "properties": [
        [
          "uid",
          {},
          "text",
          "52DFB000-3C49-4577-8003-3086001BD26A"
        ]
      ]
    },
    "...": ""
  }
}
```

Figure 86: Converting the JSID property of a VALARM component

4.1.2. JSPROP

Property Name:
JSPROP

Purpose:
This property represents a JSCalendar property in iCalendar.

Value type:
TEXT; also see "Format Definition" below for value restrictions.

Property Parameters:
The JSPTR parameter (Section 4.2.2) MUST be specified on this property. Other IANA and non-standard property parameters can be specified on this property.

Conformance:
This property can be specified multiple times in any calendar component.

Description:
This property converts an arbitrary JSCalendar property from and to iCalendar. The iCalendar property value is the JSON-encoded value of the JSCalendar property, represented as a TEXT value. The JSON value MUST NOT be the null value, and it SHOULD NOT contain insignificant whitespace as defined in Section 2 of [RFC8259]. The value of the JSPTR parameter points to the JSCalendar property within the JSCalendar object and MUST NOT start with the SOLIDUS (U+002F) character. The pointer MUST NOT reference into an array.

All JSPROP properties in a calendar component together form a PatchObject [jscalendarbis] (Section 1.4.9): the JSPTR parameter of a JSPROP property corresponds to a key in the PatchObject, the property value corresponds to the JSON value for that key. When converting from iCalendar to JSCalendar, the PatchObject MUST only be applied after all other iCalendar elements of the component have been converted. Only new properties are allowed to be set, a JSON pointer in the PatchObject that points to an existing property MUST be ignored.

Format Definition:
This property is defined by the following notation:

```
jsprop = "JSPROP" jsprop-param ":" TEXT CRLF

jsprop-param  = *(
          ; The following are MANDATORY and MUST NOT
          ; occur more than once
          ( ";" jsptr-param )
          ;
          ; The following is OPTIONAL
          ; and MAY occur more than once.
          ;
          (";" other-param)
          ;
          )
```

Example(s):

The following example illustrates how to convert a JSPROP property with a JSON boolean value

```
JSPROP;JSPTR="example.com:foo":true
"example.com:foo": true
```

Figure 87: Converting the JSPROP property with a JSON boolean value

The following example illustrates how to convert a JSPROP property with a JSON object value

```
JSPROP;JSPTR="example.com:foo":{"bar":1234\,"baz":"bam"}
"example.com:foo": {
  "bar": 1234,
  "baz": "bam"
}
```

Figure 88: Converting the JSPROP property with a JSON object value

The following example illustrates how to convert a JSPROP property that points to a property within a JSCalendar Alert. The JSON pointer in the JSPTR parameter is relative to the Alert object.

```
BEGIN:VEVENT
...
BEGIN:VALARM
JSPROP;JSPTR="example.com:foo":"bar"
...
END:VALARM
"@type": "Event",
"alerts": {
  "DB7A8058-2212-46D9-87C2-867C7F65D625": {
    "@type": "Alert",
    "example.com:foo": "bar",
    "...": ""
  }
}
```

Figure 89: Converting the JSPROP property within a VALARM component

The following example illustrates how to convert a JSPROP property that points to a property within a JSCalendar Link. The JSON pointer in the JSPTR parameter is relative to the Event object because the Link object converts to an iCalendar property. The JSID parameter (Section 4.2.1) on the ATTACH property ensures that the JSON path remains valid during conversion.

```
BEGIN:VEVENT
...
ATTACH;JSID=mylink1:https://www.rfc-editor.org/rfc/rfc8984.html
JSPROP;JSPTR="links/mylink1/example.com:foo":"bar"
...
"@type": "Event",
"links": {
  "mylink1": {
    "@type": "Link",
    "href": "https://www.rfc-editor.org/rfc/rfc8984.html",
    "example.com:foo": "bar",
    "...": ""
  }
}
```

Figure 90: Converting the JSPROP property within a Link object

4.2. New Parameters

4.2.1. JSID

Parameter Name:
JSID

Format Definition:
jsid-param = "JSID" "=" param-value

Description:
This parameter specifies the JSON object key of the JSCalendar object to which an iCalendar property converts to. For example, this parameter set on an ATTACH property within a VEVENT component defines the key of the Link object value in the Event object's "links" property (see below for an example).

The value of the JSID parameter MUST be a valid key according to the definition of the JSCalendar property to which the property that this parameter is set on converts to. Typically, this requires the value to be a valid Id [jscalendarbis] (Section 1.4.1).

Example(s):

```
ATTACH;JSID=mylink1:https://example.com
"links": {
  "mylink1": {
    "@type": "Link",
    "href": "https://example.com"
  }
}
```

Figure 91: Converting the JSID parameter on an ATTACH property

4.2.2. JSPTR

Parameter Name:
JSPTR

Format Definition:
jsptr-param = "JSPTR" "=" quoted-string

Description:
This parameter is specified on a JSPROP (Section 4.1.2) property. Its value is a JSON pointer [RFC6901] that points to a JSCalendar property.

Description:
This parameter has a single value that MUST be a valid JSON pointer as defined in [RFC6901]. The value MUST be quoted to preserve its case-sensitivity and it MUST NOT contain the DQUOTE character. See Section 3.2 of [RFC5545] for how to format parameter values.

Example(s):
JSPROP;JSPTR="example.com:foo":"bar"

For further examples, see Section 4.1.2.

5. Updates to JSCalendar

5.1. New Properties

5.1.1. iCalendar

Name:
iCalendar

Context:
Any JSCalendar object

Type:
ICalComponent (optional)

Description

This property contains information about iCalendar data that got converted to this JSCalendar object. It allows for preserving the name of iCalendar elements, such as a component's name, properties and subcomponents. This specification defines the ICalComponent object type for converting iCalendar components to a JSCalendar object. Future specifications MAY define additional value types for this property.

An ICalComponent object has the following properties:

@type: String This specifies the type of this object. This MUST be ICalComponent, if set.

name: String (mandatory) This is the name of the iCalendar component in lowercase.

components: *[][] (optional) This contains subcomponents of the iCalendar component which did not convert to standard JSCalendar elements. The value MUST be a list of iCalendar components formatted in jCal as defined in Section 3.3 of [RFC7265].

convertedProperties: String[ICalProperty] (optional) This contains conversion-related information about the component's properties that got partially or fully converted to JSCalendar. Each key defines the path to a JSCalendar element. The value for each key contains information about the iCalendar property which converted to the JSCalendar element located at that key. Unless otherwise defined for a specific iCalendar property, the path points to that JSCalendar object property to which the iCalendar property value converted to.

The key MUST be a valid key of a PatchObject as defined in Section 1.4.9 of [jscalendarbis]. The key MAY point to the key in a nested object if the element at that key was converted from an iCalendar property of the component for which the "iCalendar" property is set. It MUST NOT point into nested objects otherwise.

properties: *[][] (optional) This contains properties of the iCalendar component which did not convert to standard JSCalendar elements. The value MUST be a list of iCalendar properties formatted in jCal as defined in Section 3.4 of [RFC7265].

An ICalProperty object has the following properties:

@type: String This specifies the type of this object. This MUST

be ICalProperty, if set.

name: String (mandatory) This is the name of the iCalendar property in lowercase.

valueType: String (optional) This is the name of the iCalendar property value type in lowercase.

parameters: String[String|String[]] (optional) This contains parameters of the iCalendar property. The value MUST comply with iCalendar parameters formatted in jCal as defined in Section 3.5 of [RFC7265].

The example in Figure 92 describes how to convert unknown iCalendar elements to the "iCalendar" property. The "X-FOO" parameter set on the SUMMARY property illustrates how to preserve an unknown iCalendar parameter on a property that does convert to a standard JSCalendar element. The "X-BAR" property and "X-BAZ" component illustrate how to convert entirely unknown iCalendar elements.

```
BEGIN:VEVENT
SUMMARY;X-FOO=bar:test
...
X-BAR:bam
...
BEGIN:X-BAZ
UID:507A08F9-81D8-4D16-9480-D6D75E977943
END:X-BAZ
...
```

```
{
  "@type": "Event",
  "title": "test",
  "iCalendar": {
    "@type": "ICalComponent",
    "name": "vevent",
    "convertedProperties": {
      "title": {
        "@type": "ICalProperty",
        "name": "summary",
        "parameters": {
          "x-foo": "bar"
        }
      }
    },
    "properties": [
      [
        "x-bar",
        {},
        "unknown",
        "bam"
      ]
    ],
    "components": [
      [
        "x-baz",
        [
          [
            "uid",
            {},
            "text",
            "507A08F9-81D8-4D16-9480-D6D75E977943"
          ]
        ],
        []
      ]
    ]
  },
  "...": ""
}
```

Figure 92: Converting unknown iCalendar elements to the iCalendar property

6. IANA Considerations

6.1. Changes to the "iCalendar Element Registries"

IANA will add the following entries to the "Properties" registry:

Property JSID
Status Current
Reference Section 4.1.1

Property JSPROP
Status Current
Reference Section 4.1.2

IANA will add the following entries to the "Parameters" registry:

Parameter JSID
Status Current
Reference Section 4.2.1

Parameter JSPTR
Status Current
Reference Section 4.2.2

6.2. Changes to the "JSCalendar Registries"

IANA will add the following entries to the "JSCalendar Properties" registry:

Property Name iCalendar
Property Type ICalComponent
Property Context Event, Location, Participant, Task
Reference Section 5.1.1
Intended Usage common
Is Per-User no
Change Controller IETF

Property Name iCalendar
Property Type ICalComponent
Property Context Alert
Reference Section 5.1.1
Intended Usage common
Is Per-User yes
Change Controller IETF

7. References

7.1. Normative References

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Appendix A. Discrepancies between iCalendar and JSCalendar

This section highlights iCalendar and JSCalendar elements for which no conversion rule to a standard element is defined in this document. This is informational and only complete at the time of publication of this document.

Implementations MAY choose to convert the following elements, for example using the properties defined in Section 4 and Section 5, or they might convert them to some vendor-specific extension properties. Later RFC documents might also define new standard elements and register them at IANA, either extending this list of inconvertible elements, or rather reduce it by introducing a standard element to convert to.

A.1. Unsupported iCalendar Elements

A.1.1. Components

The following components do not convert to a standard element in JSCalendar:

* AVAILABLE [RFC7953], Section 3.1
* VAVAILABILITY [RFC7953], Section 3.1
* VFREEBUSY [RFC5545], Section 3.6.4
* VJOURNAL [RFC5545], Section 3.6.3
* VRESOURCE [RFC9073], Section 7.3
* VTIMEZONE [RFC5545], Section 3.6.5
* VSTATUS [ical-tasks], Section 14.1

A.1.2. Properties by Component

The following components are defined to contain the listed properties. But these properties do not convert to a standard JSCalendar element.

A.1.2.1. PARTICIPANT [RFC9073], Section 7.1

* CATEGORIES [RFC5545], Section 3.8.1.2
* COMMENT [RFC5545], Section 3.8.1.4
* CONTACT [RFC5545], Section 3.8.4.2
* CREATED [RFC5545], Section 3.8.7.1
* LAST-MODIFIED [RFC5545], Section 3.8.7.3
* LINK [RFC9253], Section 8.2
* LOCATION [RFC5545], Section 3.8.1.7
* PARTICIPANT-TYPE [RFC9073], Section 6.2
* PRIORITY [RFC5545], Section 3.8.1.9
* REASON [ical-tasks], Section 12.2

* RELATED-TO [RFC5545], Section 3.8.4.5
* REQUEST-STATUS [RFC5545], Section 3.8.8.3
* RESOURCES [RFC5545], Section 3.8.1.10
* STATUS [RFC5545], Section 3.8.1.11
* STRUCTURED-DATA [RFC9074], Section 6.6
* UID [RFC5545], Section 3.8.4.7
* URL [RFC5545], Section 3.8.4.6

A.1.2.2. VALARM [RFC5545], Section 3.6.6

* ATTACH [RFC5545], Section 3.8.1.1
* ATTENDEE [RFC5545], Section 3.8.4.1
* DESCRIPTION [RFC5545], Section 3.8.1.5
* DURATION [RFC5545], Section 3.8.2.5
* PROXIMITY [RFC9074], Section 8.1
* REPEAT [RFC5545], Section 3.8.6.2
* STYLED-DESCRIPTION [RFC9073], Section 6.5
* SUMMARY [RFC5545], Section 3.8.1.12
* UID [RFC5545], Section 3.8.4.7

A.1.2.3. VCALENDAR [RFC5545], Section 3.4

* CALSCALE [RFC5545], Section 3.7.1
* LINK [RFC9253], Section 8.2
* REFRESH-INTERVAL [RFC7986], Section 5.7
* URL [RFC5545], Section 3.8.4.6
* VERSION [RFC5545], Section 3.7.4

A.1.2.4. VEVENT [RFC5545], Section 3.6.1

* COMMENT [RFC5545], Section 3.8.1.4
* CONTACT [RFC5545], Section 3.8.4.2
* LINK [RFC9253], Section 8.2
* REFID [RFC9253], Section 8.3
* REQUEST-STATUS [RFC5545], Section 3.8.8.3
* RESOURCES [RFC5545], Section 3.8.1.10
* STRUCTURED-DATA [RFC9074], Section 6.6
* URL [RFC5545], Section 3.8.4.6

A.1.2.5. VLOCATION [RFC9073], Section 7.2

* DESCRIPTION [RFC5545], Section 3.8.1.5
* LINK [RFC9253], Section 8.2
* UID [RFC5545], Section 3.8.4.7
* STRUCTURED-DATA [RFC9074], Section 6.6
* STYLED-DESCRIPTION [RFC9073], Section 6.5

A.1.2.6. VTODO [RFC5545], Section 3.6.2

* COMMENT [RFC5545], Section 3.8.1.4
* COMPLETED [RFC5545], Section 3.8.2.1
* CONTACT [RFC5545], Section 3.8.4.2
* LINK [RFC9253], Section 8.2
* REFID [RFC9253], Section 8.3
* REQUEST-STATUS [RFC5545], Section 3.8.8.3
* RESOURCES [RFC5545], Section 3.8.1.10
* STRUCTURED-DATA [RFC9074], Section 6.6
* TASK-MODE [ical-tasks], Section 12.4

* URL [RFC5545], Section 3.8.4.6

A.1.3. Subcomponents by Component

The following components are defined to contain the listed subcomponents. But these subcomponents do not convert to a standard JSCalendar element.

A.1.3.1. PARTICIPANT [RFC9073], Section 7.1

* VLOCATION [RFC9073], Section 7.2

A.1.4. Properties by Value Type

The following properties convert to a standard JSCalendar element for some other value type, but they do not for the listed value types.

A.1.4.1. RDATE [RFC5545], Section 3.8.5.2

* PERIOD [RFC5545], Section 3.3.9

A.1.5. Parameters by Property

The following properties are defined to contain the listed parameters. But these parameters do not convert to a standard JSCalendar element.

A.1.5.1. ATTACH [RFC5545], Section 3.8.1.1

* FILENAME [RFC8607], Section 4.2

* MANAGED-ID [RFC8607], Section 4.3

A.1.5.2. ATTENDEE [RFC5545], Section 3.8.4.1

* DIR [RFC5545], Section 3.2.6

* SCHEDULE-AGENT [RFC6638], Section 7.1

* SCHEDULE-FORCE-SEND [RFC6638], Section 7.2

* SCHEDULE-STATUS [RFC6638], Section 7.3

* SENT-BY [RFC5545], Section 3.2.18

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.3. CATEGORIES [RFC5545], Section 3.8.1.2

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.4. CONFERENCE [RFC7986], Section 5.11

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.5. DESCRIPTION [RFC5545], Section 3.8.1.5

* ALTREP [RFC5545], Section 3.2.1

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.6. IMAGE [RFC7986], Section 5.10

* ALTREP [RFC5545], Section 3.2.1

* DISPLAY [RFC7986], Section 6.1 (if the parameter value contains more than one "displayval").

A.1.5.7. LINK [RFC9253], Section 8.2

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.8. LOCATION [RFC5545], Section 3.8.1.7

* ALTREP [RFC5545], Section 3.2.1

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.9. NAME [RFC7986], Section 5.1

* ALTREP [RFC5545], Section 3.2.1

A.1.5.10. ORGANIZER [RFC5545], Section 3.8.4.3

* DIR [RFC5545], Section 3.2.6

* SENT-BY [RFC5545], Section 3.2.18

* LANGUAGE [RFC5545], Section 3.2.10

* SCHEDULE-AGENT [RFC6638], Section 7.1

* SCHEDULE-FORCE-SEND [RFC6638], Section 7.2

* SCHEDULE-STATUS [RFC6638], Section 7.3

A.1.5.11. RECURRENCE-ID [RFC5545], Section 3.8.4.4

* RANGE [RFC5545], Section 3.2.13

A.1.5.12. RELATED-TO [RFC5545], Section 3.8.4.5

* GAP [RFC9253], Section 6.2

A.1.5.13. REQUEST-STATUS [RFC5545], Section 3.8.8.3

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.14. RESOURCES [RFC5545], Section 3.8.1.10

* ALTREP [RFC5545], Section 3.2.1

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.15. STYLED-DESCRIPTION [RFC9073], Section 6.5

* ALTREP [RFC5545], Section 3.2.1

* DERIVED [RFC9073], Section 5.3

* LANGUAGE [RFC5545], Section 3.2.10

A.1.5.16. SUMMARY [RFC5545], Section 3.8.1.12

* ALTREP [RFC5545], Section 3.2.1

A.1.5.17. TZNAME [RFC5545], Section 3.8.3.2

* LANGUAGE [RFC5545], Section 3.2.10

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