



SyncML Device Information DTD, version 1.1

Abstract

This document defines the Document Type Definition (DTD) for the XML representation of the Device Information document. This XML document describes the capabilities of the device and is used in SyncML data synchronization protocol operations.

Data synchronization provides the means for two different networked object stores to remain in identical states. Different forms of data synchronization can be categorized into one of a number of topologies, based on the architecture used by a data synchronization server, or **sync engine**. Sync engines need to understand the features of a device they synchronize with. This information is often stored in a **Device Information** document on the target device.



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Revision History

Revision	Date	Comments
v1.0a	2000-08-14	The first release to supporters.
v1.0b	2000-11-07	Minor editorial fixes.
v1.0	2000-12-07	Moved the FreeID and FreeMem elements to MetInf DTD, moved the CTCap element under the DevInf element, added VerDTD element to indicate the version of DevInf DTD, changed the content model of CTCap element, added MIME type registration and information about MIME usage, changed the publication notice.
v1.0.1	2001-05-30	Incorporated Erratas
V1.1	2001-02-15	Features Included: UTC, SupportLargeObjs, SupportNumberOfChanges



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1 Introduction

This document defines the Document Type Definition (DTD) for the XML representation of the Device Information object (DevInf.DTD). The DevInf.DTD is intended to be used to exchange device specific information. Exchange of device specific information such as available memory and item identifiers, supported local databases is a prerequisite to successful data synchronization.

Data synchronization provides the means for two different networked object stores to remain in identical states. Different forms of data synchronization can be categorized into one of a number of topologies, based on the architecture used by a data synchronization server, or sync engine. Sync engines need to understand the features of a device they synchronize with. This information is often stored in a Device Information document on the target device.

2 Formatting 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 [4].

Any reference to components of the Device Information DTD or XML snippets are specified in this *type face*.

3 Terminology

Device Information

A document or object store (i.e., a data base) on the source device that records information about the capabilities of the source device.

4 XML Usage

The device information is represented in a markup language defined by [6]. The Device Information DTD (Document Type Definition) defines the XML document type used to represent information about the capabilities of a data synchronization client device.

Device Information documents are specified using well-formed XML. However, they need not be valid XML. That is, the Device Information documents do not need to specify the XML prolog. They only need to specify the body of the XML document. This restriction allows for Device Information documents to be specified with greater terseness than well-formed, valid XML documents.

The Device Information DTD makes use of XML name spaces. Name spaces must be declared on the first element type that uses an element type from the name space.

Names in XML are case sensitive. By convention in the Device Information DTD, the element type and attribute list names are specified with a "Hungarian" like notation of the



first character in each word of the name in upper case text and remainder of the characters in each word of the names specified in lower case text. For example, `DevInf` for the Device Information root element type tag.

The element types in the Device Information DTD are defined within a namespace associated with the URI http://www.syncml.org/docs/devinf_v11_20020215.dtd or the URN `syncml:devinf`.

The formal public identifier (FPI) is the traditional format for specifying unique identifiers for XML entities. The FPI for the DTD described in this specification is:

```
-//SyncML//DTD DevInf 1.1//EN
```

The name for the file object corresponding to this document on a device MUST be:

```
devinf11
```

The Device Information DTD also makes use of XML standard attributes, such as `xml:lang`. Any XML standard attribute can be used in a SyncML document.

XML can be viewed as more verbose than alternative binary representations. This is often cited as a reason why it may not be appropriate for low bandwidth network protocols. In most cases, this specification uses shortened element type and attribute names. This provides a minor reduction in verbosity. Additionally, the Device Information documents can be encoded in a tokenized, binary format defined by [6]. The token values used to encode the Device Information documents are defined in chapter 7 of this document. The use of [6] format is external to this specification and should be transparent to any XML application supporting this DTD. The combination of the use of shortened element type and attribute names and an alternative binary format makes this specification competitive, from a compressed format perspective, with alternative, but private, binary representations for Device Information documents.

One of the main advantages of XML is that it is a widely accepted International recommendation for text document markup. It provides for both human readability and machine processability. In addition, XML allows the originator to capture the structure of a document, not just its content. This is extremely useful for applications such as data synchronization, where not just content, but structure semantics is often exchanged.

The SyncML Device Information document also can be identified as a MIME content type. MIME is the Internet standard for identifying multipurpose message contents. It provides a useful mechanism for differentiating between different content and document types.

4.1 MIME Usage

The [5] Internet standard provides an industry-accepted mechanism for identifying different content types. A MIME media type identifies the SyncML Device Information document. The media type for the Device Information document is registered within the vendor tree. There are two MIME content types for the Device Information document. The MIME content type of `application/vnd.syncml-devinf+xml` identifies the clear-text XML representation for the Device Information document. The MIME content type of `application/vnd.syncml-devinf+wbxml` identifies the WBXML binary



representation for the Device Information document. Section 14 of this specification specifies the MIME content type registration for these two MIME media types.

One of these two MIME content types **MUST BE** used for identifying Device Information documents within transport and session level protocols that support MIME content types.

5 Device Information Element Descriptions

The following element types are included in the Device Information DTD.

5.1 CTCap

Usage: Specifies the content type capabilities of the device.

Parent Elements: DevInf

Restrictions: The content type capabilities of the device **SHOULD** be defined.

Content Model:

```
CTCap ((CTType, (PropName, (ValEnum+ | (DataType, Size?))?, DisplayName?, (ParamName, (ValEnum+ | (DataType, Size?))?, DisplayName?)*))+)
```

Attributes: None.

Example:

```
<CTCap>
  <CTType>text/x-vcard</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>END</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>2.1</ValEnum>
  <PropName>FN</PropName>
    <DataType>chr</DataType>
  <PropName>N</PropName>
  <PropName>TEL</PropName>
    <ParamName>WORK</ParamName>
    <ParamName>HOME</ParamName>
  <CTType>text/x-vcalendar</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCALENDAR</ValEnum>
    <ValEnum>VEVENT</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>1.0</ValEnum>
  <PropName>DTSTART</PropName>
    <DataType>datetime</DataType>
  <PropName>DTEND</PropName>
    <DataType>datetime</DataType>
  <PropName>DESCRIPTION</PropName>
</CTCap>
```




5.2 CType

Usage: Specifies the type of a supported content type.

Parent Elements: CTCap, Rx, Rx-Pref, Tx, Tx-Pref

Restrictions: If a parent element is present, this element type is required. The value for this element can be e.g., `text/x-vcard`, `text/vcard`, `text/x-vcalendar`, or `text/calendar`. Some other possible values for this element are specified in the SyncML representation protocol [1]. Other values can also be specified.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example:

```
<CTCap>
  <CTType>text/vcard</CTType>
</CTCap>
```

5.3 DataStore

Usage: Specifies the properties of a given local datastore.

Parent Elements: DevInf

Restrictions: One or more of the element types are required. One element type is required for each of the local datastores.

Content Model:

```
(SourceRef, DisplayName?, MaxGUIDSize?, Rx-Pref, Rx*, Tx-Pref, Tx*,
DSMem?, SyncCap)
```

Attributes: None.

Example:

```
<DataStore>
  <SourceRef>./contacts</SourceRef>
  <DisplayName>Addressbook</DisplayName>
  <MaxGUIDSize>32</MaxGUIDSize>
  <Rx-Pref>
    <CTType>text/vcard</CTType>
    <VerCT>3.0</VerCT>
  </Rx-Pref>
  <Rx>
    <CTType>text/x-vcard</CTType>
    <VerCT>2.1</VerCT>
  </Rx>
  <Tx-Pref>
    <CTType>text/vcard</CTType>
    <VerCT>3.0</VerCT>
  </Tx-Pref>
```



```

<Tx>
  <CTType>text/x-vcard</CTType>
  <VerCT>2.1</VerCT>
</Tx>
<DSMem>
  <SharedMem/>
  <MaxMem>65539</MaxMem>
  <MaxID>512</MaxID>
</DSMem>
<SyncCap>
  <SyncType>1</SyncType>
  <SyncType>7</SyncType>
</SyncCap>
</DataStore>

```

5.4 DataType

Usage: Specifies the datatype of a given content type property or parameter.

Parent Elements: CTCap

Restrictions: Type values for this element type can be one of chr, int, bool, bin, datetime, phonenum as defined in the table below. Other values can also be specified.

DataType	Datatype of a content type property or parameter
chr	Character
int	Integer
bool	Boolean
bin	Binary
datetime	Date and time of day
phonenum	Phone number

Content Model:

(#PCDATA)

Attributes: None.

Example:

```

<PropName>FN</PropName>
  <DataType>chr</DataType>
<PropName>TEL</PropName>
  <ParamName>WORK</ParamName>
  <DataType>phonenum</DataType>
  <ParamName>HOME</ParamName>
  <DataType>phonenum</DataType>

```

5.5 DevID

Usage: Specifies the identifier of the source synchronization device.

Parent Elements: DevInf

Restrictions: The content information MUST specify a theoretically, globally unique identifier. This element type is mandatory.

**Content Model:**`(#PCDATA)`**Attributes:** None.**Example:**`<DevID>1218182THD012345-2</DevID>`

5.6 DevInf

Usage: Specifies the root or document element type of the Device Information document.**Parent Elements:** None.**Restrictions:** This element type is mandatory and **MUST** be the root or document element.**Content Model:**`(VerDTD, Man?, Mod?, OEM?, FwV?, SwV?, HwV?, DevID, DevTyp, UTC?, SupportLargeObjs?, SupportNumberOfChanges?, DataStore+, CTCap*, Ext*)`**Attributes:**

Name	Type	Occurrance	Description
xmlns	CDATA	IMPLICIT	Must be present with a value of 'syncml:devinf'.

Example:

```

<DevInf>
  <VerDTD>1.1</VerDTD>
  <DevID>1218182THD012345-2</DevID>
  <DevTyp>pager</DevTyp>
  <DataStore>
    ...
  </DataStore>
</DevInf>

```

5.7 DevTyp

Usage: Specifies the type of the source synchronization device.**Parent Elements:** DevInf**Restrictions:** Type values for this element type can be e.g. pager, handheld, pda, phone, smartphone, server, workstation, as defined in the table below. Other values can also be specified. This element type is mandatory.

DevTyp	Type of the device
pager	Pager
handheld	Handheld PC/PDA
pda	Palm sized PC/PDA
phone	Cellular phone
smartphone	Smartphone
server	Server-class computer



workstation	Workstation-class computer
-------------	----------------------------

Content Model:

(#PCDATA)

Attributes: None.**Example:**

<DevTyp>pager</DevTyp>

5.8 DisplayName

Usage: Specifies the display name of a given local datastore, or the display name of a given content type property or parameter.

Parent Elements: DataStore, CTCap

Restrictions: This element type is optional.

Content Model:

(#PCDATA)

Attributes: None.

Example: The following example specifies the display name of the contacts datastore.

<pre><DataStore> <SourceRef>./contacts</SourceRef> <DisplayName>Addressbook</DisplayName> </DataStore></pre>
--

5.9 DSMem

Usage: Specifies the maximum memory and item identifier for a given local datastore.

Parent Elements: DataStore

Restrictions: The element type is optional.

Content Model:

(SharedMem?, MaxMem?, MaxID?)

Attributes: None.

Example: The following example specifies a shared datastore memory.

<pre><DSMem> <SharedMem/> <MaxMem>65539</MaxMem> <MaxID>512</MaxID> </DSMem></pre>
--



5.10 Ext

Usage: Specifies the non-standard, experimental extensions supported by the device. The extensions are specified in terms of the XML element type name and the value.

Parent Elements: DevInf

Restrictions: The Ext element type MUST specify the extension element name. It may also specify one or more enumerated values. Multiple non-standard extensions can be specified by specifying the Ext element type multiple times. This element type is optional.

Content Model:

(XNam, Xval*)

Attributes: None.

Example: The following example specifies a non-standard extension, named "CliVer" for a fictitious company, Foo, which takes values of "5.0", "5.01" or "5.02".

```
<Ext><XNam>X-Foo-CliVer</XNam><XVal>5.0</XVal><XVal>5.01</XVal>  
<XVal>5.02</XVal></Ext>
```

5.11 FwV

Usage: Specifies the firmware version of the device.

Parent Elements: DevInf

Restrictions: If there is no firmware version of the device available, then the content information can also be a date. If the content information is a date, then it MUST be formatted as a complete representation, basic format of an [3] date or date and UTC time of day. For example, 19980114 or 19990714T133000Z. Only hours, minutes and second MUST be specified in the time component. This element type is optional.

Content Model:

(#PCDATA)

Attributes: None.

Example:

```
<FwV>1.01</FwV>
```

5.12 HwV

Usage: Specifies the hardware version of the device.

Parent Elements: DevInf

Restrictions: If there is no hardware version of the device available, then the content information can also be a date. If the content information is a date, then it MUST be formatted as a complete representation, basic format of an [3] date or date and UTC time of



day. For example, 19980114 or 19990714T133000Z. Only hours, minutes and second MUST be specified in the time component. This element type is optional.

Content Model:

```
(#PCDATA)
```

Attributes: None.**Example:**

```
<HwV>0.1a</HwV>
```

5.13 Man

Usage: Specifies the name of the manufacturer of the device.**Parent Elements:** DevInf**Restrictions:** This element type is optional.**Content Model:**

```
(#PCDATA)
```

Attributes: None.**Example:**

```
<Man>Foo Industries, Inc.</Man>
```

5.14 MaxGUIDSize

Usage: Specifies the maximum size of a global unique identifier for a given local datastore, in bytes the device is able to receive and store.**Parent Elements:** DataStore**Restrictions:** Content information MUST be specified as the decimal integer number indicating the maximum size, in bytes of the temporary GUID the client device is able to receive and store for a given local datastore, and the server is allowed to send. The device acting as a client MUST, and the device acting as a server MUST NOT send this information.**Content Model:**

```
(#PCDATA)
```

Attributes: None.**Example:** The following is an example of a client capable of receiving and storing a maximum 2 bytes long GUID.

```
<MaxGUIDSize>2</MaxGUIDSize>
```



5.15 MaxID

Usage: Specifies the maximum number of items that can be stored in a given local datastore.

Parent Elements: DSMem

Restrictions: Content information **MUST** be specified as the decimal integer number of maximum item identifiers that are available for all items in the local datastore. This element type is optional.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example: The following is an example of a maximum of 1024 items.

```
<MaxID>1024</MaxID>
```

5.16 MaxMem

Usage: Specifies the maximum memory size for a given local datastore, in bytes.

Parent Elements: DSMem

Restrictions: Content information **MUST** be specified as the decimal integer number of maximum free bytes of memory available in the local database. This element type is optional.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example: The following is an example of 65539 bytes.

```
<MaxMem>65539</MaxMem>
```

5.17 Mod

Usage: Specifies the model name or model number of the device.

Parent Elements: DevInf

Restrictions: This element type is optional.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example:



```
<Mod>1447</Mod>
```

5.18 OEM

Usage: Specifies the OEM (Original Equipment Manufacturer) of the device.

Parent Elements: DevInf

Restrictions: This element type is optional.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example:

```
<OEM>Bar Works, Ltd.</OEM>
```

5.19 ParamName

Usage: Specifies supported parameters of a given content type property.

Parent Elements: CTCap

Restrictions: If the content type is either `text/x-vcard`, `text/vcard`, `text/x-vcalendar` or `text/calendar`, the value for this element type **MUST** be one of the values defined in the table below. Sending the ParamName element is optional if the device supports all the parameters of all the supported properties (e.g. property TEL is supported, and parameters PREF, WORK, HOME, VOICE, FAX, MSG, CELL, PAGER, BBS, MODEM, CAR, ISDN, and VIDEO are all supported).

text/x-vcard	
PropName	ParamName
ADR	DOM, INTL, POSTAL, PARCEL, HOME, WORK
EMAIL	AOL, AppleLink, ATTMail, CIS, eWorld, INTERNET, IBMMail, MCIMail, POWERSHARE, PRODIGY, TLX, X400
LABEL	DOM, INTL, POSTAL, PARCEL, HOME, WORK
TEL	PREF, WORK, HOME, VOICE, FAX, MSG, CELL, PAGER, BBS, MODEM, CAR, ISDN, VIDEO
PHOTO	GIF, CGM, WMF, BMP, MET, PMB, DIB, PICT, TIFF, PS, PDF, JPEG, MPEG, MPEG2, AVI, QTIME
SOUND	WAVE, PCM, AIFF
KEY	X509, PGP
LOGO	GIF, CGM, WMF, BMP, MET, PMB, DIB, PICT, TIFF, PS, PDF, JPEG, MPEG, MPEG2, AVI, QTIME
text/x-vcalendar	
PropName	ParamName
ATTENDEE	ROLE, STATUS, RSVP, EXPECT
AALARM	WAVE, PCM, AIFF



text/vcard	
PropName	ParamName
LOGO	GIF, CGM, WMF, BMP, MET, PMB, DIB, PICT, TIFF, PS, PDF, JPEG, MPEG, MPEG2, AVI, QTIME, other IANA registered image types
LABEL	DOM, INTL, POSTAL, PARCEL, HOME, WORK, other IANA registered parameter names
PHOTO	GIF, CGM, WMF, BMP, MET, PMB, DIB, PICT, TIFF, PS, PDF, JPEG, MPEG, MPEG2, AVI, QTIME, other IANA registered image types
ADR	DOM, INTL, POSTAL, PARCEL, HOME, WORK, other IANA registered parameter names
TEL	PREF, WORK, HOME, VOICE, FAX, MSG, CELL, PAGER, BBS, MODEM, CAR, ISDN, VIDEO, other IANA registered parameter names
EMAIL	PREF, INTERNET, X400, other IANA registered address types
SOUND	WAVE, PCM, AIFF, other IANA registered audio formats
KEY	X509, PGP, other IANA registered certificate types
text/calendar	
PropName	ValEnum
ATTENDEE	CN , CUTYPE , DELEGATED-FROM , DELEGATED-TO , DIR , LANGUAGE , MEMBER , PARTSTAT , ROLE , RSVP , SENT-BY
ORGANIZER	CN , DIR , LANGUAGE , SENT-BY

Content Model:

```
( #PCDATA )
```

Attributes: None.

Example: The following is an example of supporting both the HOME and WORK parameters of the vCard TEL property.

```
<CTCap>
  <CTType>text/x-vcard</CTType>
  <PropName>TEL</PropName>
    <ParamName>HOME</ParamName>
    <ParamName>WORK</ParamName>
</CTCap>
```

5.20 PropName

Usage: Specifies a supported property of a given content type.

Parent Elements: CTCap

Restrictions: If the content type is either text/x-vcard, text/vcard, text/x-vcalendar or text/calendar, the value for this element type MUST be one of the values defined in the table below.

Content type	PropName
--------------	----------



text/x-vcard	BEGIN, VERSION, END, FN, N, PHOTO, BDAY, ADR, LABEL, TEL, EMAIL, MAILER, TZ, GEO, TITLE, ROLE, LOGO, AGENT, ORG, NOTE, REV, SOUND, URL, UID, KEY
text/x-vcalendar	BEGIN, VERSION, END, DAYLIGHT, GEO, PROPID, TZ, ATTACH, ATTENDEE, AALARM, CATEGORIES, CLASS, DCREATED, COMPLETED, DESCRIPTION, DALARM, DUE, DTEND, EXDATE, EXRULE, LAST-MODIFIED, LOCATION, MALARM, RNUM, PRIORITY, PALARM, RELATED-TO, RDATE, RRULE, RESOURCES, SEQUENCE, DTSTART, STATUS, SUMMARY, TRANSP, URL, UID, VALUE, RSVP, ENCODING
text/vcard	BEGIN, VERSION, END, FN, N, NICKNAME, PHOTO, BDAY, ADR, LABEL, TEL, EMAIL, MAILER, TZ, GEO, TITLE, ROLE, LOGO, AGENT, ORG, CATEGORIES, NOTE, REV, SOUND, URL, UID, CLASS, KEY
text/calendar	ALTREP, CN, CUTYPE, DELEGATED-TO, DELEGATED-FROM, DIR, ENCODING, FBTYPE, LANGUAGE, MEMBER, PARTSTAT, RANGE, RELATED, RELTYPE, ROLE, RSVP, TZID, VALUE, BEGIN, END, VERSION, CALSCALE, GEO, METHOD, PROPID, TZ, VERSION, ATTACH, CATEGORIES, CLASS, COMMENT, DESCRIPTION, LOCATION, PERCENT-COMPLETE, PRIORITY, RESOURCES, STATUS, SUMMARY, COMPLETED, DTEND, DUE, DTSTART, DURATION, FREEBUSY, TRANSP, TZNAME, TZOFFSETFROM, TZOFFSETTO, TZURL, ATTENDEE, CONTACT, ORGANIZER, RECURRENCE-ID, RELATED-TO, URL, UID, EXDATE, EXRULE, RDATE, RNUM, RRULE, ACTION, REPEAT, TRIGGER, CREATED, DTSTAMP, LAST-MODIFIED, SEQUENCE, XTOKEN, REQUEST-STATUS

Content Model:

(#PCDATA)

Attributes: None.

Example: The following is an example of supporting properties BEGIN, VERSION, DTSTART, DTEND, DESCRIPTION, END of the text/x-vcalendar content type.

```
<CTType>text/x-vcalendar</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCALENDAR</ValEnum>
    <ValEnum>VEVENT</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>1.0</ValEnum>
  <PropName>DTSTART</PropName>
  <PropName>DTEND</PropName>
  <PropName>DESCRIPTION</PropName>
  <PropName>END</PropName>
    <ValEnum>VCALENDAR</ValEnum>
    <ValEnum>VEVENT</ValEnum>
</CTCap>
```

5.21 Rx

Usage: Specifies the supported type and version of a content type received by the device.

Parent Elements: DataStore



Restrictions: This element type is optional.

Content Model:

```
(CTType, VerCT)
```

Attributes: None.

Example:

```
<Rx>  
  <CTType>text/x-vcard</CTType>  
  <VerCT>2.1</VerCT>  
</Rx>
```

5.22 Rx-Pref

Usage: Specifies the preferred type and version of a content type received by the device.

Parent Elements: DataStore

Restrictions: The Rx-Pref element type is required for each specified datastore.

Content Model:

```
(CTType, VerCT)
```

Attributes: None.

Example:

```
<Rx-Pref>  
  <CTType>text/vcard</CTType>  
  <VerCT>2.1</VerCT>  
</Rx-Pref>
```

5.23 SharedMem

Usage: Specifies if the datastore memory is shared. If the memory is shared, the actual memory space is used also by other datastores, and the actual memory space may be more limited than in theory it might be.

Parent Elements: DSMem

Restrictions: The content of this element MUST be empty. This element type is used as a flag, and if this element type is present, then the given datastore memory is shared. This element is optional.

Content Model:

```
EMPTY
```

Attributes: None.

Example: The following is an example of shared datastore memory.

```
<DSMem>
```



```
<SharedMem/>
<MaxMem>65539</MaxMem>
<MaxID>512</MaxID>
</DSMem>
```

5.24 Size

Usage: Specifies the size of a property or a parameter of a given content type.

Parent Elements: CTCap

Restrictions: If the value of the DataType element is either `int` or `bin`, then the Size element type is used to specify the size of the property or parameter.

Content Model:

```
( #PCDATA )
```

Attributes: None.

Example: The following is an example of supporting the vCard property PHOTO, and the size of the GIF image is 2400 bytes.

```
<PropName>PHOTO</PropName>
<ParamName>GIF</PropName>
<DataType>bin</DataType>
<Size>2400</Size>
```

5.25 SourceRef

Usage: Specifies the reference URI for a local database.

Parent Elements: DataStore

Restrictions: If the DataStore element type is present, then the SourceRef element type is required. The content information of this element type is either the absolute or relative URI of the datastore.

Content Model:

```
( #PCDATA )
```

Attributes: None.

Example: The following is an example of a source reference to a relative URI for the InBox database.

```
<SourceRef> ./InBox</SourceRef>
```

5.26 SupportLargeObjs

Usage: Specifies that the device supports handling of large objects.

Parent Element: DevInf



Restrictions: If the sending device has specified <SupportLargeObjs/> elements in its Device Information then the receiving device MUST (for server) or SHOULD (for client) specify <MaxObjSize> in its Meta Information as specified in the Meta Information specification v1.1[8].

Content Model:

(EMPTY)

Attributes: None.

Example:

```
<DevInf>
  <VerDTD>1.1</VerDTD>
  <DevID>1218182THD012345-2</DevID>
  <DevTyp>pager</DevTyp>
  <SupportLargeObjs/>
  <DataStore>
  ...
</DataStore>
</DevInf>
```

5.27 SupportNumberOfChanges

Usage: Specifies that the device supports number of changes

ParentElement: DevInf

Restrictions: Server SHOULD send <NumberOfChanges>, specified in Representation protocol specification v1.1 [1], if the client specifies <SupportNumberOfChanges/>. Server MUST NOT send <NumberOfChanges> if the client has not specified <SupportNumberOfChanges/> element in its Device Information.

Content Model:

(EMPTY)

Attributes: None.

Example:

```
( <DevInf>
  <VerDTD>1.1</VerDTD>
  <DevID>1218182THD012345-2</DevID>
  <DevTyp>pager</DevTyp>
  <SupportNumberOfChanges/>
  <DataStore>
  ...
</DataStore>
</DevInf>
```

5.28 SwV

Usage: Specifies the software version of the device.

Parent Elements: DevInf



Restrictions: If there is no software version of the device available, then the content information can also be a date. If the content information is a date, then it MUST be formatted as a complete representation, basic format of a [3] date or date and UTC time of day. For example, 19980114 or 19990714T133000Z. Only hours, minutes and second MUST be specified in the time component. This element type is optional.

Content Model:

(#PCDATA)

Attributes: None.

Example:

<SwV>0.1a</SwV>

5.29 SyncCap

Usage: Specifies the synchronization capabilities of the given local datastore.

Parent Elements: DataStore

Restrictions: This element is mandatory.

Content Model:

(SyncType+)

Attributes: None.

Example: The following is an example of supporting both two-way, and server alerted sync.

```
<DataStore>
...
  <SyncCap>
    <SyncType>1</SyncType>
    <SyncType>7</SyncType>
  </SyncCap>
</DataStore>
```

5.30 SyncType

Usage: Specifies the type of the supported synchronization.

Parent Elements: SyncCap

Restrictions: If the device supports synchronizations specified in the SyncML Sync protocol specification [2], then the value of this element MUST be one of the synchronization types specified in the table below. Other values can also be specified. One or more of the element types are required. One element type is required for each of the supported synchronizations.

Support of 'two-way sync'	'1'
Support of 'slow two-way sync'	'2'



Support of 'one-way sync from client only'	'3'
Support of 'refresh sync from client only'	'4'
Support of 'one-way sync from server only'	'5'
Support of 'refresh sync from server only'	'6'
Support of 'server alerted sync'	'7'

Content Model:

```
(#PCDATA)
```

Attributes: None.**Example:** The following is an example of identifying support for two-way sync.

```
<SyncType>1</SyncType>
```

5.31 Tx

Usage: Specifies the supported type and version of a content type transmitted by the device.**Parent Elements:** DataStore**Restrictions:** This element type is optional.**Content Model:**

```
(CTType, VerCT)
```

Attributes: None.**Example:**

```
<Tx>  
  <CTType>text/x-vcard</CTType>  
  <VerCT>2.1</VerCT>  
</Tx>
```

5.32 Tx-Pref

Usage: Specifies the preferred type and version of a content type transmitted by the device.**Parent Elements:** DataStore**Restrictions:** The Tx-Pref element type is required for each specified datastore.**Content Model:**

```
(CTType, VerCT)
```

Attributes: None.**Example:**



```
<Tx-Pref>
  <CTType>text/vcard</CTType>
  <VerCT>3.0</VerCT>
</Tx-Pref>
```

5.33 UTC

Usage: Specifies that the device supports UTC based time.

Parent Element: DevInf

Restrictions: If UTC flag is present, the server SHOULD send time in UTC form, else MUST send in local time. Client MAY send time in local or UTC format.

Content Model:

```
( EMPTY )
```

Attributes: None.

Example:

```
<DevInf>
  <VerDTD>1.1</VerDTD>
  <DevID>1218182THD012345-2</DevID>
  <DevTyp>pager</DevTyp>
  <UTC/>
  <DataStore>
    ...
  </DataStore>
</DevInf>
```

5.34 ValEnum

Usage: Specifies the supported enumerated value of a given content type property.

Parent Elements: CTCap

Restrictions: If the content type is either `text/x-vcard`, `text/vcard`, `text/x-vcalendar` or `text/calendar`, the value for this element type MUST be one of the values defined in the table below.

text/x-vcard	
PropName	ValEnum
BEGIN	VCARD
END	VCARD
VERSION	2.1
text/x-vcalendar	
PropName	ValEnum
BEGIN	VCALENDAR, VEVENT, VTOD
END	VCALENDAR, VEVENT, VTOD
VERSION	1.0
CLASS	PUBLIC, PRIVATE, CONFIDENTIAL



text/vcard	
PropName	ValEnum
BEGIN	VCARD
END	VCARD
VERSION	3.0
CLASS	PUBLIC, PRIVATE, CONFIDENTIAL
text/calendar	
PropName	ValEnum
CUTYPE	INDIVIDUAL, GROUP, RESOURCE, ROOM, UNKNOWN
BEGIN	VCALENDAR, VEVENT, VTODO, VJOURNAL, VFREEBUSY, VTIMEZONE, VALARM
END	VCALENDAR, VEVENT, VTODO, VJOURNAL, VFREEBUSY, VTIMEZONE, VALARM
VERSION	2.0
ATTACH	URI, BINARY
CLASS	PUBLIC, PRIVATE, CONFIDENTIAL
ACTION	AUDIO, DISPLAY, EMAIL, PROCEDURE
RELTYPE	PARENT, CHILD, SIBLING

Content Model:

(#PCDATA)

Attributes: None.**Example:** The following is an example of supporting iCalendar binary attachments.

```
<CTCap>
  <CTType>text/calendar</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCALENDAR</ValEnum>
    <ValEnum>VEVENT</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>2.0</ValEnum>
  <PropName>ATTACH</PropName>
    <ValEnum>BINARY</ValEnum>
</CTCap>
```

5.35 VerCT**Usage:** Specifies the version of a supported content type.**Parent Elements:** Rx, Rx-Pref, Tx, Tx-Pref**Restrictions:** If a parent element is present, this element type is required.**Content Model:**

(#PCDATA)

Attributes: None.**Example:**



```
<Rx>
  <CTType>text/x-vcard</CTType>
  <VerCT>2.1</VerCT>
</Rx>
```

5.36 VerDTD

Usage: Specifies the major and minor version identifier of the Device Information DTD used in the representation of the Device Information document.

Parent Elements: DevInf

Restrictions: Major revisions of the specification create incompatible changes that will generally require a new parser. Minor revisions involve changes that do not impact basic compatibility of the parser. When the XML document conforms to this revision of the Device Information specification the value MUST be 1.1. The element type MUST be included in the DevInf element.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example:

```
<DevInf>
  <VerDTD>1.1</VerDTD>
  ...
</DevInf>
```

5.37 XNam

Usage: Specifies the name of one of the DevInf extension element types.

Parent Elements: Ext

Restrictions: The element type is required whenever an Ext element is present.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example:

```
<Ext>
  <XNam>X-Foo-Cliver</XNam>
  <XVal>5.0</Xval>
  <XVal>5.01</Xval>
  <XVal>5.02<Xval>
</Ext>
```

5.38 XVal

Usage: Specifies one of the valid values for a DevInf extension element type.

**Parent Elements:** Ext

Restrictions: One or more of the element types are required whenever an Ext element is present. One element type is required for each of the valid values for the extension element type. Ranges of valid values can be specified by a sequence of the first value in the range, followed by the string ".." (i.e., PERIOD PERIOD), followed by the last value in the range.

Content Model:

```
(#PCDATA)
```

Attributes: None.

Example: The following example is for an extension element type that has a range of valid integer values from 1 to 5.

```
<Ext>
  <XNam>X-Bar-Enum</XNam>
  <XVal>1</XVal>
  <XVal>..</XVal>
  <XVal>5</XVal>
</Ext>
```



6 Device Information DTD

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```
<!-- This DTD defines device information that is used within the SyncML
DTD.

This DTD is to be identified by the URN string "syncml:devinf". -->

<!-- Root element -->

<!ELEMENT DevInf (VerDTD, Man?, Mod?, OEM?, FwV?, SwV?, HwV?, DevID,
DevTyp, UTC?, SupportLargeObjs?, SupportNumberOfChanges?, DataStore+,
CTCap*, Ext*)>

<!ELEMENT Man (#PCDATA)>

<!ELEMENT Mod (#PCDATA)>

<!ELEMENT OEM (#PCDATA)>

<!ELEMENT FwV (#PCDATA)>

<!ELEMENT SwV (#PCDATA)>

<!ELEMENT HwV (#PCDATA)>

<!ELEMENT DevID (#PCDATA)>

<!ELEMENT DevTyp (#PCDATA)>

<!ELEMENT DataStore (SourceRef, DisplayName?, MaxGUIDSize?, Rx-Pref, Rx*,
Tx-Pref, Tx*, DSMem?, SyncCap)>

<!ELEMENT MaxGUIDSize (#PCDATA)>

<!ELEMENT Rx-Pref (CTType, VerCT)>

<!ELEMENT Rx (CTType, VerCT)>

<!ELEMENT Tx-Pref (CTType, VerCT)>

<!ELEMENT Tx (CTType, VerCT)>

<!ELEMENT DSMem (SharedMem?, MaxMem?, MaxID?)>

<!ELEMENT SharedMem EMPTY>

<!ELEMENT SourceRef (#PCDATA)>

<!ELEMENT DisplayName (#PCDATA)>

<!ELEMENT CTCap ((CTType, (PropName, (ValEnum+ | (DataType,
Size?))?,DisplayName?, (ParamName, (ValEnum+ | (DataType,
Size?))?,DisplayName?)*))+>

<!ELEMENT CTType (#PCDATA)>

<!ELEMENT DataType (#PCDATA)>
```



```
<!ELEMENT Size (#PCDATA)>
<!ELEMENT PropName (#PCDATA)>
<!ELEMENT ValEnum (#PCDATA)>
<!ELEMENT ParamName (#PCDATA)>
<!ELEMENT SyncCap (SyncType+)>
<!ELEMENT SyncType (#PCDATA)>
<!ELEMENT Ext (XNam,XVal*)>
<!ELEMENT XNam (#PCDATA)>
<!ELEMENT XVal (#PCDATA)>
<!ELEMENT MaxMem (#PCDATA)>
<!ELEMENT MaxID (#PCDATA)>
<!ELEMENT VerCT (#PCDATA)>
<!ELEMENT VerDTD (#PCDATA)>
<!ELEMENT UTC EMPTY>
<!ELEMENT SupportLargeObjs EMPTY>
<!ELEMENT SupportNumberOfChanges EMPTY>
<!-- End of DTD -->
```

7 WBXML Definitions

This version of the DevInf DTD specification is associated with the WBXML code space FD2 and the formal public identifier -//SYNCOML//DTD DevInf 1.1//EN.

The following WBXML token codes represent element types (i.e., tags) from code page 0x00, DevInf DTD.

Element Type Name	WBXML Tag Token (Hex Value)
CTCap	05
CTType	06
DataStore	07
DataType	08
DevID	09
DevInf	0A
DevTyp	0B
DisplayName	0C
DSMem	0D
Ext	0E



FwV	0F
HwV	10
Man	11
MaxGUIDSize	12
MaxID	13
MaxMem	14
Mod	15
OEM	16
ParamName	17
PropName	18
Rx	19
Rx-Pref	1A
SharedMem	1B
Size	1C
SourceRef	1D
SwV	1E
SyncCap	1F
SyncType	20
Tx	21
Tx-Pref	22
ValEnum	23
VerCT	24
VerDTD	25
Xnam	26
Xval	27
UTC	28
SupportNumberOfChanges	29
SupportLargeObjs	2A

8 Static Conformance Requirements

Static conformance requirements (SCR) specify the features that are optional, mandatory and recommended within implementations conforming to this specification.

Simple tables are used to specify this information

In these tables, optional features are specified by a "MAY", mandatory features are specified by a "MUST" and recommended features are specified by a "SHOULD", as defined in RFC 2119 [4].

An implementation, which does not include a particular option, MUST be prepared to interoperate with another implementation, which does include the option, though perhaps with reduced functionality.

The following specifies the static conformance requirements for the SyncML Device Information element types for devices conforming to this specification.

Element Type	Support of Synchronization Server		Support of Synchronization Client	
	Sending	Receiving	Sending	Receiving



CTCap	SHOULD	MUST	SHOULD	SHOULD
CTType	MUST	MUST	MUST	MUST
DataStore	MUST	MUST	MUST	MUST
DataType	MAY	MUST	MAY	MAY
DevID	MUST	MUST	MUST	MUST
DevInf	MUST	MUST	MUST	MUST
DevTyp	MUST	MUST	MUST	MUST
DisplayName	MAY	MAY	MAY	MAY
DSMem	MAY	SHOULD	SHOULD	MAY
Ext	MAY	MAY	MAY	MAY
FwV	MAY	SHOULD	SHOULD	MAY
HwV	MAY	SHOULD	SHOULD	MAY
Man	MAY	SHOULD	SHOULD	MAY
MaxGUIDSize	MUST NOT	MUST	MUST	MUST NOT
MaxID	MAY	SHOULD	SHOULD	MAY
MaxMem	MAY	SHOULD	SHOULD	MAY
Mod	MAY	MAY	MAY	MAY
OEM	MAY	MAY	MAY	MAY
ParamName	SHOULD	MUST	SHOULD	SHOULD
PropName	SHOULD	MUST	MUST	SHOULD
Rx	MAY	MUST	MAY	MUST
Rx-Pref	MUST	MUST	MUST	MUST
SharedMem	SHOULD	MAY	SHOULD	MAY
Size	MAY	MUST	MAY	MAY
SourceRef	MUST	MUST	MUST	MUST
SupportLargeObjs	SHOULD	MUST	SHOULD	SHOULD
SupportNumberOfChanges	MAY	MUST	MAY	MAY
SwV	MAY	SHOULD	SHOULD	MAY
SyncCap	MUST	MUST	MUST	MUST
SyncType	MUST	MUST	MUST	MUST
Tx	MAY	MUST	MAY	MUST
Tx-Pref	MUST	MUST	MUST	MUST
UTC	MAY	MUST	MAY	MAY
ValEnum	SHOULD	MUST	MUST	SHOULD
VerCT	MUST	MUST	MUST	MUST
VerDTD	MUST	MUST	MUST	MUST
Xnam	MAY	MAY	MAY	MAY
Xval	MAY	MAY	MAY	MAY

9 Examples

The following is an example of a XML representation for the device information object. A XML representation of a device information object that conforms to this specification must include the name space definition on the `devinf` element type.

```
<DevInf xmlns='syncml:devinf'>
  <VerDTD>1.1</VerDTD>
  <Man>Big Factory, Ltd.</Man>
  <Mod>4119</Mod>
  <OEM>Jane's phones</OEM>
  <FwV>2.0e</FwV>
```




```
<SwV>2.0</SwV>
<HwV>1.22I</HwV>
<DevID>1218182THD000001-2</DevID>
<DevTyp>phone</DevTyp>
</UTC>
</SupportLargeObjs>
</SupportNumberOfChanges>
<DataStore>
  <SourceRef>./contacts</SourceRef>
  <DisplayName>Phonebook</DisplayName>
  <MaxGUIDSize>32</MaxGUIDSize>
  <Rx-Pref>
    <CTType>text/vcard</CTType>
    <VerCT>3.0</VerCT>
  </Rx-Pref>
  <Tx-Pref>
    <CTType>text/vcard</CTType>
    <VerCT>3.0</VerCT>
  </Tx-Pref>
  <Tx>
    <CTType>text/x-vcard</CTType>
    <VerCT>2.1</VerCT>
  </Tx>
  <DSMem>
    <MaxMem>32650</MaxMem>
    <MaxID>250</MaxID>
  </DSMem>
  <SyncCap>
    <SyncType>1</SyncType>
    <SyncType>7</SyncType>
  </SyncCap>
</DataStore>
<CTCap>
  <CTType>text/x-vcard</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>END</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>2.1</ValEnum>
  <PropName>N</PropName>
  <PropName>TEL</PropName>
    <ParamName>VOICE</ParamName>
    <ParamName>FAX</ParamName>
    <ParamName>CELL</ParamName>
  <CTType>text/vcard</CTType>
  <PropName>BEGIN</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>END</PropName>
    <ValEnum>VCARD</ValEnum>
  <PropName>VERSION</PropName>
    <ValEnum>3.0</ValEnum>
  <PropName>N</PropName>
  <PropName>TEL</PropName>
    <ParamName>VOICE</ParamName>
    <ParamName>FAX</ParamName>
    <ParamName>CELL</ParamName>
</CTCap>
<Ext>
```



```
<XNam>srtmsg</XNam>
  <XVal>Hello World</XVal>
</Ext>
<Ext>
  <XNam>endmsg</XNam>
  <XVal>Goodbye</XVal>
</Ext>
</DevInf>
```



10 References

- [1] SyncML Representation protocol specification v1.1, [SyncML](#).
- [2] SyncML Synchronization protocol specification v1.1, [SyncML](#).
- [3] Data elements and interchange formats - Information interchange - Representation of dates and times, [ISO](#).
- [4] Key words for use in RFCs to Indicate Requirement Levels, RFC 2119 [IETF](#).
- [5] Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies, [IETF](#).
- [6] WAP Binary XML Content Format Specification, [WAP Forum](#).
- [7] Extensible Markup Language (XML) 1.0, [W3C](#).
- [8] SyncML Meta Information protocol specification v1.1, [SyncML](#).



11 MIME Media Type Registration

The following section is the MIME media type registrations for SyncML Device Information specific MIME media types.

11.1 application/vnd.syncml-devinf+xml

To: ietf-types@iana.org

Subject: Registration of MIME media type application/vnd.syncml-devinf+xml

MIME media type name: application

MIME subtype name: vnd.syncml-devinf+xml

Required parameters: None

Optional parameters: charset, verDTD

Content-Type MIME header.

charset Parameter

Purpose: Specifies the character set used to represent the Device Information document. The default character set for SyncML Device Information document is UTF-8, as defined [RFC 2279].

Formal Specification: The following ABNF defines the syntax for the parameter.

```
chrset-param = ";" "charset" "=" <any IANA registered charset identifier>
```

Interoperability considerations: Implementations that have support for the mandatory features of this content type will greatly increase the chances of interoperating with other implementations supporting this content type. Conformance to this content type requires an implementation to support every mandatory feature.

verDTD Parameter

Purpose: Specifies the major/minor revision identifiers for the SyncML Device Information specification that defines the DevInf MIME media type. If present, MUST be the same value as that specified by the "VerDTD" element type in the DevInf MIME content information. If not present, the default value "1.0" is to be assumed.

Formal Specification: The following ABNF defines the syntax for the parameter.

```
verDTD-param = ";" "verDTD" "=" 1*numeric "." 1*numeric
```

```
text = 1*ALPHA
```

```
numeric = "0" / "1" / "2" / "3" / "4" / "5" / "6" / "7" / "8" / "9"
```

Published specification:

http://www.syncml.org/docs/syncml_devinf_v11_20020215.pdf



Applications, which use this media type: This MIME content type is intended for common use by networked data synchronization applications.

Additional information:

Magic number(s): None

File extension(s): XDM

Macintosh File Type Code(s): XDM

Person & email address to contact for further information:
admins@syncml.org

Intended usage: COMMON

Author/Change controller: admins@syncml.org

11.2 application/vnd.syncml-devinf+wbxml

To: ietf-types@iana.org

Subject: Registration of MIME media type application/vnd.syncml-devinf+wbxml

MIME media type name: application

MIME subtype name: vnd.syncml-devinf+wbxml

Required parameters: None

Optional parameters: charset, verDTD

Content-Type MIME header.

charset Parameter

Purpose: Specifies the character set used to represent the Device Information document. The default character set for SyncML Device Information document is UTF-8, as defined [RFC 2279].

Formal Specification: The following ABNF defines the syntax for the parameter.

```
chrset-param = ";" "charset" "=" <any IANA registered charset identifier>
```

Interoperability considerations: Implementations that have support for the mandatory features of this content type will greatly increase the chances of interoperating with other implementations supporting this content type. Conformance to this content type requires an implementation to support every mandatory feature.

verDTD Parameter

Purpose: Specifies the major/minor revision identifiers for the SyncML Device Information specification that defines the DevInf MIME media type. If present, MUST be the same value as that specified by the "VerDTD" element type in the DevInf MIME content information. If not present, the default value "1.0" is to be assumed.



Formal Specification: The following ABNF defines the syntax for the parameter.

```
vertdtd-param = ";" "vertdtd" "=" 1*numeric "." 1*numeric
```

```
text = 1*ALPHA
```

```
numeric = "0" / "1" / "2" / "3" / "4" / "5" / "6" / "7" / "8" / "9"
```

Published specification:

http://www.syncml.org/docs/syncml_devinf_v11_20020215.pdf

Applications, which use this media type: This MIME content type is intended for common use by networked data synchronization applications.

Additional information:

Magic number(s): None

File extension(s): BDM

Macintosh File Type Code(s): BDML

Person & email address to contact for further information:

admins@syncml.org

Intended usage: COMMON

Author/Change controller: admins@syncml.org