

# hData Record Format v0.8

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## 1 Introduction

The hData Record Format (HRF) describes the XML representation of the continuity of care information in an electronic health record (EHR). The HRF is implemented through a component-specific XML documents that are linked and organized through a “master document”. For better organization, the individual XML documents are put into a hierarchy, with the master document at the root of this hierarchy. While the HRF defines a core set of components, it is fully extensible and can easily be adopted for more complex situations.

This specification only describes the organization of data within an abstract hData Record (HDR). Another specification describes how a HDR is serialized [1].

### 1.1 Namespaces

This document uses the following namespaces. This specification uses a number of namespace prefixes throughout; they are listed in Table 1. Note that the choice of any namespace prefix is arbitrary and not semantically significant.

Namespace Prefix	Namespace URI	Description
hrf	<a href="http://projecthdata.org/hdata/schemas/2009/06/core">http://projecthdata.org/hdata/schemas/2009/06/core</a>	Namespace for elements in this document
hrf-md	<a href="http://projecthdata.org/hdata/schemas/2009/11/meta-data">http://projecthdata.org/hdata/schemas/2009/11/meta data</a>	Namespace for meta data
xs	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>	XML Schema namespace

### 1.2 Glossary (Non-Normative)

**hData Record Format (HRF)** - The part of the hData specification that defines the abstract hierarchy, meta-data schema, and document organization of the hData record.

24 **hData Record (HDR)** - an single instantiation of the HRF.

25 **hData Restful API (HRA)** - the part of the hData specification that defines the basic HTTP-based API for  
26 accessing or modifying an HDR.

27 **hData Specification** - a normative specification that defines the HRF, the HRA, and a file-based serialization  
28 format.

29 **hData Content Profile (HCP)** - a profile of the medical content of an HDR. An HCP is specified separately from  
30 the HRF. The hData Project defines an initial HCP (iHCP) that covers the 35 data elements for EHRs/EMRs  
31 defined by the National Quality Foundation.

32 **Electronic Medical Record (EMR)** - the medical record or records of a single patient in the IT system of an actor  
33 (health provider, government entity, payer, etc.). In this definition, an HDR is a type of EMR.

34 **Electronic Health Record (EHR)** - the collection of all EMRs of a single patient, across organizational and  
35 national boundaries.

36 **EHR System** - An IT system that creates, stores, and manages EMRs.

37 **Clinical Document Architecture (CDA)** - an XML specification by Health Layer 7 (HL7) that is intended to be  
38 used for EMRs.

39 **Continuity of Care Record (CCR)** - a specification by ASTM that is intended to be used for summary/continuity  
40 of care documentation. A CCM is a type of EMR.

41 **Continuity of Care Document (CCD)** - a profile of the CDA that accommodates the medical information of the  
42 CCR.

43 **HITSP/C32 (C32)** - a constrained profile of the CCD that is intended to simplify implementation and improve  
44 interoperability. There is no normative schema for C32. Note that HITSP has recently split up C32 into  
45 HITSP/C80 and HITSP/C83.

46 **MITRE/L32 (L32)** - a significantly constrained profile of the C32 specification. L32 comes with a normative  
47 schema and can be mapped onto the HRF.

### 48 **1.3 Notational Conventions**

49 The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT",  
50 "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#).

51 When describing concrete XML schemas, this specification uses the following notation: each member of an  
52 element's [children] or [attributes] property is described using an XPath-like notation (e.g.,  
53 /x:MyHeader/x:SomeProperty/@value1). The use of {any} indicates the presence of an element wildcard. The  
54 use of @{any} indicates the presence of an attribute wildcard.

55  
56 Note also that only the W3C XML schemas linked in Appendix A at the end of this document are normative –  
57 any schema fragment or other schema description is informational only.

## 2 Hierarchical Organization

The basic approach of the hData Record Format is to represent the Continuity of Care data through linked XML documents, which are organized through an abstract hierarchy. The hData storage and network protocols map this abstract hierarchy to a concrete implementation, such as a directory folder or web resource hierarchy.

HRF only defines representations for the most common CCD constructs. In order to be able to accommodate more complex situations, it was designed with a number of extension points that allow the definition and insertion of new components. Extension can be optional, i.e. a parser that is not capable of processing the data in the extension may safely ignore it. If an extension is marked mandatory and the parser has no support for it, the parser MUST notify the user or raise an exception.

### 2.1 Overall Structure

At the root of the hierarchy is the master document (MD) and additional documents, that have relevance to the entirety of the continuity of care document. The actual information is contained in component specific sections, some of which are REQUIRED. The component specific sections are the primary extension points within the hierarchy. Implementers can either extend existing component sections or define new sections. Such newly created sections MUST be registered in the MD to be accessible.

Each section corresponds to a single set of XML documents, i.e. each section is associated with documents that comply to a given schema. Section documents that are required by this specification are defined through W3C XML Schema.

### 2.2 Root Document

The root document is as the root of the hierarchy. It contains the following elements (REQUIRED if not marked otherwise):

- /hrf:id - This element uniquely identifies the document, e.g. through a textual representation of a UUID. It is RECOMMENDED to not use absolute URIs that may be assumed to be resolvable to a concrete resource location.
- /hrf:version - The version of the hData Record Format used within this document.
- /hrf:created - Creation date of the document, using the W3C XML Schema Date data type. This data SHOULD be significant to at least the second.
- /hrf:lastModified - Last modification of the document, using the W3C XML Schema Date data type. This data SHOULD be significant to at least the second.
- /hrf:extensions - Node containing a list of extensions (list of hrf:extension elements). Any extension to this specification MUST register itself in this section.
- /hrf:extensions/hrf:extension (OPTIONAL) - This element contains a unique identifier for the extension.
- /hrf:extensions/hrf:extension/@requirement - This attribute MUST be either "mandatory" or "optional". If the parser has no support for a mandatory extension, it MUST notify the user or raise an exception. It is RECOMMENDED to not process the document.
- /hrf:sections - This node contains references to all component-specific sections (hrf:section)
- /hrf:sections/hrf:section (OPTIONAL) - A hrf:section element MAY contain additional hrf:section elements. The path attributes SHOULD be concatenated to construct a hierarchy.

- 96 • /hrf:sections/hrf:section/@path - This attribute is really a path segment, used to construct the full path  
97 to the section from the root.
- 98 • /hrf:sections/hrf:section/@typeId - A unique identifier. This identifier MUST conform to the  
99 requirements for XML namespace identifiers. It represents the default content type for this section.
- 100 • /hrf:sections/hrf:section/@name - Used for a human-friendly name to this section.

101 Extensions MAY extend the master document with additional elements, such as e.g. a mechanism to record  
102 versions of the data contained in the document.

### 103 2.3 Sections

104 Section within a hData record form an abstract hierarchy, similar to the file folder structure commonly used in  
105 hierarchical file systems. Section can contain either Section Documents or other Sections. Sections are  
106 identified by their path. The path to a Section is constructed by starting with a forward slash ("/") and  
107 appending all section path names from the root of the HDR to the Section.

### 108 2.4 Section Documents

109 At each section a collection of documents can be obtained. Within each Section, there MUST NOT be more  
110 than one type of section documents, identified by the URI of the typeId attribute in the corresponding section  
111 node of the root document. Any URI used within the sections node for the typeId attribute MUST be registered  
112 as an Extension in the extensions node of the root document.

#### 113 2.4.1 Section Document Meta Data

114 Each section contains a collection of meta data artifacts that are associated with each Section Document in an  
115 XML fragment starting with <hrf-md:DocumentMetaData>

- 116 • /DocumentMetaData - DocumentMetaData is the top-level element for the hData meta data  
117 specification.
- 118 • /DocumentMetaData/@MediaType - This attribute contains the media type of the document itself. If it  
119 is not present, the default media type of the content type is assumed.
- 120 • /DocumentMetaData/@ContentType - This attribute contains the URI for the content type of this  
121 document. If it is not present, the content type for the Section is implied. Note that the current hData  
122 Content Profiles assume that the content type for all Section Documents within a given Section is  
123 uniform.
- 124 • /DocumentMetaData/PedigreeInfo (OPTIONAL) - This optional node holds the pedigree information for  
125 the Section Document. It is of type <hrf-md:PedigreeInfo>
- 126 • /DocumentMetaData/DocumentId - This required element of type xs:String holds an identifier for the  
127 Section Document. It MUST be unique over any given Section.
- 128 • /DocumentMetaData/LinkedDocuments (OPTIONAL) - This optional node holds a list of URI links to  
129 documents that are related to this Section Document. Use depends on the semantics of the Section  
130 Document Type. It can have <hrf-md:LinkInfo> typed child elements.
- 131 • /DocumentMetaData/RecordDate - This required node holds the information about Document creation  
132 and modification.
- 133 • /DocumentMetaData/RecordDate/CreatedDateTime - This required element of type <xs:dateTime>  
134 contains the dateTime of creation of this document. If this document is not derived (see

- 135 PedigreeInfo), this is the time of the creation of the original. If this document is derived from another  
136 origin, this element contains the date of derivation.
- 137 • /DocumentMetaData/ReecordDate/Modified (OPTIONAL) - This optional node is first created when the  
138 document is changed for the first time. It contains a collection of modification dates with optional  
139 pedigree information of the modifier.
  - 140 • /DocumentMetaData/ReecordDate/Modified/ModfiedDateTime - This required element of type  
141 <xs:dateTime> records a dateTime when the document was modified.
  - 142 • /DocumentMetaData/ReecordDate/Modified/PedigreeInfo (OPTIONAL) – This optional node of type  
143 <hrf-md:PedigreeInfo> contains the pedigree information of the modifier.
  - 144 • /DocumentMetaData/Confidentiality (OPTIONAL) – This element contains controls for confidentiality -  
145 details are TBD.
  - 146 • /DocumentMetaData/AccessControl (OPTIONAL) - This element contains controls for access control -  
147 details are TBD.
  - 148 • /DocumentMetaData/Consent (OPTIONAL) - This element contains controls for consent - details are  
149 TBD.

150 There are two more types that are being used in <DocumentMetaData>: <hrf-md:PedigreeInfo> and <hrf-  
151 md:LinkInfo>. This is the schema for <hrf-md:PedigreeInfo>

- 152 • /PedigreeInfo - This node contains the pedigree information.
- 153 • /PedigreeInfo/XMLSignature (OPTIONAL) - This optional node contains the signature information on the  
154 document or this meta data.
- 155 • /PedigreeInfo/XMLSignature/@documentMethod - This optional attribute indicates what method was  
156 used to transform binary Section Document mediatypes into XML files for signature. Currently the only  
157 permitted methods are xml, sha256 and base64. xml is the default XML signature over XML  
158 documents. base64 encodes a data stream into an XML document. The root node is root and contains  
159 the BASE64 encoded data. sha256 calculates a hash over the binary stream and signs this hash.
- 160 • /PedigreeInfo/XMLSignature/ds:Signature (0..unbounded) - A collection of XML Signatures. This  
161 Signature MUST contain: 1. a valid Reference to either the metadata or the Section Document 2. the  
162 ds:KeyInfo for the signer (optional with DSig - required here)
- 163 • /PedigreeInfo/Source (OPTIONAL) - This node indicates the source of this data.
- 164 • /PedigreeInfo/Source/@derived - If the data is derived (i.e. copied or compiled from other sources) this  
165 attribute of type <xs:boolean> MUST be set to true.
- 166 • /PedigreeInfo/Source/PedigreeInfo (0..unbounded) – This element contains the <hrf-md:PedigreeInfo>  
167 of the all source from which this document was derived.
- 168 • /PedigreeInfo/Source/Document (0..unbounded) – This element of type <hrf-md:LinkInfo> contains  
169 links to all documents from which this document was derived.
- 170 • /PedigreeInfo/Author (0..unbounded) – This element contains the names or identifiers of all author(s).
- 171 • /PedigreeInfo/Organization (0..unbound) - This element identified the organization(s) at which this  
172 document was created.

173 This is the schema for <hrf-md:LinkInfo>:

- 174 • /LinkInfo

- 175
- /LinkInfo/Target –This required element of type <xs:anyURI> contains the absolute link to the
- 176 referenced SectionDocument.
- 177
- /LinkInfo/##any (OPTIONAL) – extension point.

## 178 2.5 hData Content Profiles

179 This specification does not specify which sections are required for an hData Record. This is done in separate  
180 hData Content Profiles (HCP).

## 181 3 Common Data Types

182 Common data types such as address, person information, etc. in section documents SHOULD use the data  
183 types described below. They are contained in the <http://projecthdata.org/hdata/schemas/2009/06/core>  
184 schema.

### 185 3.1 Name

186 This element represents the name of a person. It contains the following elements:

- 187
- /hrf:name/hrf:title (OPTIONAL) – The person’s title, such as Mr., Dr., etc.
- 188
- /hrf:name/hrf:given – Used to represent a person’s given names. A person’s first name SHOULD be  
189 present in the first occurrence of the given element. Middle names SHOULD appear in subsequent  
190 occurrences of the given element.
- 191
- /hrf:name/hrf:lastname – Used to represent the person’s surname or family name
- 192
- /hrf:name/hrf:suffix (OPTIONAL) – A suffix for the person’s name, such as Jr., Sr., III, etc.

### 193 3.2 Address

194 This element provides a representation of a postal address. It contains the following elements:

- 195
- /hrf:address/hrf:streetAddress (OPTIONAL) – SHOULD contain one line of the postal address. This  
196 element MAY be repeated to capture multiple lines of a postal address. This element MUST NOT  
197 contain city, state, zip code or country information.
- 198
- /hrf:address/hrf:city – The city of the postal address
- 199
- /hrf:address/hrf:stateOrProvince – The state or province of the postal address. For US States, this value  
200 MUST be represented in FIPS State Alpha Code (<http://www.itl.nist.gov/fipspubs/fip5-2.htm>)
- 201
- /hrf:address/hrf:zip
- 202
- /hrf:address/hrf:country (OPTIONAL) – The country of the postal address. If present, the country  
203 name MUST be represented as an ISO 3166-1 country name.

### 204 3.3 Telecom

205 Telecom elements are used to describe various forms of contact.

- 206       ▪ /hrf:telecom/@use – This attribute describes whether the contact is for an individual’s residence,  
207       place of business , vacation home, or other.
- 208       ▪ /hrf:telecom/@value – This attribute states the actual contact means and MUST be in url  
209       semantics.
- 210       ▪ /hrf:telecom/@preferred – (OPTIONAL) Boolean attribute that denotes whether the telecom is a  
211       preferred means of contact.

### 212 3.4 Person

213 This element provides the representation of basic demographic information about an individual.

- 214       ▪ /hrf:person/name – The name of the individual defined in an hrf:name element as described  
215       above.
- 216       ▪ /hrf:person/hrf:addresses – A list of address information related to the individual defined using the  
217       hrf:address structure described above
- 218       ▪ /hrf:person/hrf:telecom - 0 or more hrf:telecom elements related to the individual described using  
219       the hrf:telecom element described above.

### 220 3.5 Actor

221 The Actor substitutionGroup is used to represent situations when an entity may be either a person or an  
222 organization.

### 223 3.6 Organization

224 This element is used to represent an organization and the basic demographic information associated with the  
225 organization.

- 226       ▪ /hrf:organization/hrf:name – The name of the organization, this is a simple string value
- 227       ▪ /hrf:organization/hrf:pointsOfContact – A list of 0 or more points of contact for the organization  
228       represented as a list of hrf:person elements described above.
- 229       ▪ /hrf:organization/hrf:address – 0 or more hrf:address elements for the organization

### 230 3.7 CodedValue

231 This is not an element but rather a complexType for a generalized approach for creating elements that require  
232 coded value information. Leaving it as a complexType allows for the codedValue to have a more meaningful  
233 name to the element derived from it while still retaining the generic codedValue attributes. As this is a  
234 complexType the xpath statements below are not accurate as hrf:codedValue would need to be replaced with  
235 an actual instantiation of the complexType

- 236       ▪ /hrf:codedValue/@code – the code value from the codeSystem being used
- 237       ▪ /hrf:codedValue/@codeSystem – the coded system from which the code is from
- 238       ▪ /hrf:codedValue/@version – the version of the codeSystem used
- 239       ▪ /hrf:codedValue/@displayName – the displayName of the codedValue as described by the  
240       codeSystem
- 241       ▪ /hrf:codedValue/text() – codedValue elements can contain a free text block to further describe the  
242       coded value element in question

### 243 3.8 Date

244 This element is used to represent a singular point in time.

- 245       ▪ /hrf:date/text() – the value of the date in question in xsd:date format

### 246 3.9 DateRange

247 This element is used to represent a date range.

- 248       ▪ /hrf:dateRange/hrf:low – the low end of the date range represented as an hrf:date element
- 249       ▪ /hrf:dateRange/@high - (Optional) this represents the high end of the date range represented as
- 250       an hrf:date element or if not included represents an open ended date range

### 251 3.10 InformationSource

252 This element is used to represent where the information in a section may have originated from.

- 253       ▪ /hrf:/informationSource/hrf:author – (Optional) the author of the referenced document
- 254       represented as an hrf:person element
- 255       ▪ /hrf:informationSource/date - (Optional) the date the referenced document was created
- 256       represented as an hrf:date element
- 257       ▪ /hrf:informationSource/reference – (Optional) a reference to the document from which the section
- 258       information was derived
- 259       ▪ /hrf:informationSource/informant - the individual or organization who added the information to
- 260       the record, represented as an hrf:actor as described above

### 261 3.11 Description

262 This element is used to represent a general purpose description element that can also contain coded  
263 information.

- 264       ▪ /hrf:description/hrf:text – free text block
- 265       ▪ /hrf:description/hrf:codedValue – list of codedValues that pertain to the description

### 266 3.12 AbstractSection

267 This abstract complex type is used to represent a set of common feature that all section documents should  
268 contain. As this is a complexType the xpath statements below are not accurate as hrf:abstractSection would  
269 need to be replaced with an actual instantiation of the complexType.

- 270       ▪ /hrf:abstractSection/hrf:description – (Optional) as described above
- 271       ▪ /hrf:abstractSection/hrf:informationSource – (Optional) as described above

## 272 4 Appendix A: Normative Schemas

### 273 4.1 Root Document

274 This section contains the normative schema for the root document (see Section 2.2).

275 

```
<?xml version="1.0" encoding="UTF-8" ?>
```

```
276 <!-- Copyright 2009 The MITRE Corporation
277
278 Licensed under the Apache License, Version 2.0 (the "License");
279 you may not use this file except in compliance with the License.
280 You may obtain a copy of the License at
281
282 http://www.apache.org/licenses/LICENSE-2.0
283
284 Unless required by applicable law or agreed to in writing, software
285 distributed under the License is distributed on an "AS IS" BASIS,
286 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
287 implied.
288 See the License for the specific language governing permissions and
289 limitations under the License. -->
290
291 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
292 elementFormDefault="qualified"
293 targetNamespace="http://projecthdata.org/hdata/schemas/2009/06/core"
294 xmlns:core="http://projecthdata.org/hdata/schemas/2009/06/core">
295   <xs:element name="root">
296     <xs:complexType>
297       <xs:all>
298         <xs:element ref="core:documentId"/>
299         <xs:element ref="core:version"/>
300         <xs:element ref="core:created"/>
301         <xs:element ref="core:lastModified"/>
302         <xs:element ref="core:extensions"/>
303         <xs:element ref="core:sections"/>
304       </xs:all>
305     </xs:complexType>
306   </xs:element>
307   <xs:element name="documentId" type="xs:string"/>
308   <xs:element name="version" type="xs:string"/>
309   <xs:element name="created" type="xs:date"/>
310   <xs:element name="lastModified" type="xs:date"/>
311   <xs:element name="extensions">
312     <xs:complexType>
313       <xs:sequence>
314         <xs:element minOccurs="0" maxOccurs="unbounded"
315 ref="core:extension"/>
316       </xs:sequence>
317     </xs:complexType>
318   </xs:element>
319   <xs:element name="extension">
320     <xs:complexType mixed="true">
321       <xs:attributeGroup ref="core:extension"/>
322     </xs:complexType>
323   </xs:element>
324   <xs:element name="sections">
325     <xs:complexType>
326       <xs:sequence>
327         <xs:element minOccurs="0" maxOccurs="unbounded"
328 ref="core:section"/>
329       </xs:sequence>
330     </xs:complexType>
```

```

331 </xs:element>
332 <xs:attributeGroup name="extension">
333   <xs:attribute name="requirement" use="required">
334     <xs:simpleType>
335       <xs:restriction base="xs:token">
336         <xs:enumeration value="mandatory"/>
337         <xs:enumeration value="optional"/>
338       </xs:restriction>
339     </xs:simpleType>
340   </xs:attribute>
341 </xs:attributeGroup>
342 <xs:element name="section">
343   <xs:complexType>
344     <xs:sequence>
345       <xs:element minOccurs="0" maxOccurs="unbounded"
346 ref="core:section"/>
347     </xs:sequence>
348     <xs:attribute name="path" use="required"/>
349     <xs:attribute name="name" use="required"/>
350     <xs:attribute name="typeId" use="required"/>
351   </xs:complexType>
352 </xs:element>
353 </xs:schema>
354

```

## 355 4.2 Section Document Meta Data

356 This section contains the normative schema for the Section Document meta data (see Section 2.4.1).

```

357 <?xml version="1.0" encoding="UTF-8"?>
358 <!-- Copyright 2009 The MITRE Corporation
359
360 Licensed under the Apache License, Version 2.0 (the "License");
361 you may not use this file except in compliance with the License.
362 You may obtain a copy of the License at
363
364 http://www.apache.org/licenses/LICENSE-2.0
365
366 Unless required by applicable law or agreed to in writing,
367 software
368 distributed under the License is distributed on an "AS IS" BASIS,
369 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
370 implied.
371 See the License for the specific language governing permissions
372 and
373 limitations under the License. -->
374
375 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
376   xmlns:hd-
377 md="http://projecthdata.org/hdata/schemas/2009/11/metadata"
378   xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
379
380 targetNamespace="http://projecthdata.org/hdata/schemas/2009/11/metada
381 ta">
382   <xs:import namespace="http://www.w3.org/2000/09/xmldsig#"

```

```

383         schemaLocation="http://www.w3.org/TR/2002/REC-xmlldsig-
384 core-20020212/xmlldsig-core-schema.xsd"/>
385     <xs:complexType name="DocumentMetaData">
386         <xs:annotation>
387             <xs:documentation>
388                 DocumentMetaData is the top-level element for the
389 hData meta data specification. It is
390                 embedded with every Atom 1.0 Content node.
391             </xs:documentation>
392         </xs:annotation>
393         <xs:sequence>
394             <xs:element minOccurs="0" name="PedigreeInfo" type="hd-
395 md:PedigreeInfo">
396                 <xs:annotation>
397                     <xs:documentation>
398                         This optional node holds the pedigree
399 information for the Section Document.
400                     </xs:documentation>
401                 </xs:annotation>
402             </xs:element>
403             <xs:element name="DocumentId" type="xs:string">
404                 <xs:annotation>
405                     <xs:documentation>
406                         This required element holds an identifier for
407 the Section Document. It MUST be unique over any given
408                         Section feed.
409                     </xs:documentation>
410                 </xs:annotation>
411             </xs:element>
412             <xs:element minOccurs="0" name="LinkedDocuments">
413                 <xs:annotation>
414                     <xs:documentation>
415                         This optional node holds a list of URI links
416 to documents that are related to this
417                         Section Document. Use depends on the
418 semantics of the Section Document Type.
419                     </xs:documentation>
420                 </xs:annotation>
421             </xs:complexType>
422             <xs:sequence>
423                 <xs:element maxOccurs="unbounded" name="Link"
424 type="hd-md:LinkInfo"/>
425             </xs:sequence>
426         </xs:complexType>
427     </xs:element>
428     <xs:element name="RecordDate">
429         <xs:annotation>
430             <xs:documentation>
431                 This required node holds the information
432 about Document creation and modification.
433             </xs:documentation>
434         </xs:annotation>
435     </xs:complexType>
436     <xs:sequence>
437         <xs:element name="CreatedDateTime"

```

```

438 type="xs:dateTime">
439     <xs:annotation>
440         <xs:documentation>
441             This required element contains
442 the dateTime of creation of this document.
443             If this document is not derived
444 (see PedigreeInfo), this is the time of the
445             creation of the original. If this
446 document is derived from another origin, this element
447             contains the date of derivation.
448         </xs:documentation>
449     </xs:annotation>
450 </xs:element>
451 <xs:element minOccurs="0" name="Modified">
452     <xs:annotation>
453         <xs:documentation>
454             This optional node is first
455 created when the document is changed for the first time.
456             It contains a collection of
457 modification dates with optional pedigree information of the
458             modifier.
459         </xs:documentation>
460     </xs:annotation>
461     <xs:complexType>
462         <xs:sequence minOccurs="1"
463 maxOccurs="unbounded">
464             <xs:element
465 name="ModifiedDateTime" type="xs:dateTime">
466                 <xs:annotation>
467                     <xs:documentation>
468                         This required element
469 record a dateTime when the document was modified.
470                     </xs:documentation>
471                 </xs:annotation>
472             </xs:element>
473             <xs:element minOccurs="0"
474 name="PedigreeInfo"
475                 type="hd-md:PedigreeInfo">
476                 <xs:annotation>
477                     <xs:documentation>
478                         This optional node
479 contains the pedigree information of the modifier.
480                     </xs:documentation>
481                 </xs:annotation>
482             </xs:element>
483         </xs:sequence>
484     </xs:complexType>
485 </xs:element>
486 </xs:sequence>
487 </xs:complexType>
488 </xs:element>
489     <xs:element minOccurs="0" name="Confidentiality"
490 type="xs:string">
491         <xs:annotation>
492             <xs:documentation>

```

```

493           This element contains controls for
494 confidentiality - details are TBD.
495           </xs:documentation>
496           </xs:annotation>
497         </xs:element>
498         <xs:element minOccurs="0" name="AccessControl">
499           <xs:annotation>
500             <xs:documentation>
501               This element contains controls for access
502 control - details are TBD.
503             </xs:documentation>
504           </xs:annotation>
505
506         </xs:element>
507         <xs:element minOccurs="0" name="Consent">
508           <xs:annotation>
509             <xs:documentation>
510               This element contains controls for consent -
511 details are TBD.
512             </xs:documentation>
513           </xs:annotation>
514
515         </xs:element>
516       </xs:sequence>
517       <xs:attribute name="MediaType" type="xs:string">
518         <xs:annotation>
519           <xs:documentation>
520             This attribute contains the media type of the
521 document itself. If it is not present, the
522 default media type of the content type is
523 assumed.
524           </xs:documentation>
525         </xs:annotation>
526       </xs:attribute>
527       <xs:attribute name="ContentType" type="xs:anyURI"
528 use="optional">
529         <xs:annotation>
530           <xs:documentation>
531             This attribute contains the URI for the content
532 type of this document. If it is not present,
533 the content type for the Section is implied. Note
534 that the current hData Content Profiles assume
535 that the content type for all Section Documents
536 within a given Section is uniform.
537           </xs:documentation>
538         </xs:annotation>
539       </xs:attribute>
540     </xs:complexType>
541     <xs:complexType name="PedigreeInfo">
542       <xs:annotation>
543         <xs:documentation>
544           This node contains the pedigree information.
545         </xs:documentation>
546       </xs:annotation>
547     </xs:sequence>

```

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548     <xs:element minOccurs="0" name="XmlSignature"
549 maxOccurs="unbounded">
550         <xs:annotation>
551             <xs:documentation> This optional node contains
552 the signature information on
553             the document or this meta data.
554 </xs:documentation>
555         </xs:annotation>
556         <xs:complexType>
557             <xs:sequence>
558                 <xs:element ref="ds:Signature">
559                     <xs:annotation>
560                         <xs:documentation> This Signature
561 MUST contain: 1. a valid Reference
562 to either the metadata or the
563 Section Document 2. the ds:KeyInfo
564 for the signer (optional with
565 DSig - required here)
566                 </xs:documentation>
567                 </xs:annotation>
568             </xs:element>
569         </xs:sequence>
570
571         <xs:attribute name="documentMethod">
572             <xs:annotation>
573                 <xs:documentation>This optional attribute
574 indicates what method was used
575 to transform binary Section Document
576 mediatypes into XML files for
577 signature. Currently the only permitted
578 methods are xml and base64.
579 xml is the default XML signature over XML
580 documents. base64 encodes
581 a data stream into an XML document. The
582 root node is root and
583 contains the BASE64 encoded data.
584 </xs:documentation>
585             </xs:annotation>
586             <xs:simpleType>
587                 <xs:restriction base="xs:string">
588                     <xs:enumeration value="base64"/>
589                     <xs:enumeration value="xml"/>
590                     <xs:enumeration value="sha256"/>
591                 </xs:restriction>
592             </xs:simpleType>
593         </xs:attribute>
594     </xs:complexType>
595 </xs:element>
596 <xs:element minOccurs="0" maxOccurs="1" name="Source">
597     <xs:annotation>
598         <xs:documentation>This node indicates the source
599 of this data. </xs:documentation>
600     </xs:annotation>
601 </xs:element>
602 </xs:complexType>

```

```

603         <xs:sequence>
604             <xs:element name="PedigreeInfo" type="hd-
605 md:PedigreeInfo" minOccurs="0"/>
606             <xs:element maxOccurs="unbounded"
607 minOccurs="0" name="Document"
608                 type="hd-md:LinkInfo"/>
609         </xs:sequence>
610         <xs:attribute name="derived" type="xs:boolean">
611             <xs:annotation>
612                 <xs:documentation>If the data is derived
613 (i.e. copied or compiled from other sources) this attribute MUST be
614 set to true. </xs:documentation>
615             </xs:annotation>
616         </xs:attribute>
617     </xs:complexType>
618 </xs:element>
619 <xs:element minOccurs="0" name="Author" type="xs:string">
620     <xs:annotation>
621         <xs:documentation>The identifier of the creators
622 of this document. For derived documents, this is the author. Note
623 that this identifier can identify machines as well as humans.
624 </xs:documentation>
625     </xs:annotation>
626 </xs:element>
627 <xs:element minOccurs="0" name="Organization"
628 type="xs:string">
629     <xs:annotation>
630         <xs:documentation>This element identifies the
631 organization. </xs:documentation>
632     </xs:annotation>
633 </xs:element>
634 </xs:sequence>
635 </xs:complexType>
636 <xs:complexType name="LinkInfo">
637     <xs:sequence>
638         <xs:element name="Target" type="xs:anyURI"/>
639         <xs:any maxOccurs="unbounded" minOccurs="0"/>
640     </xs:sequence>
641 </xs:complexType>
642 </xs:schema>

```

## 5 Bibliography

- [1] G. Beuchelt, R. Dingwell, A. Gregorowicz, and H. Sleeper, "hData Packaging and Network Transport Specification," The MITRE Corporation, 2009.

