

Network Working Group  
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## XML DTD for ACAP – ACAP data interchange format

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A version of this draft document is intended for submission to the RFC editor as a Proposed Standard for the Internet Community. Discussion and suggestions for improvement are requested.

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### [0.](#) Meta-information on this draft

This information is intended to facilitate discussion. It will be removed when this document leaves the Internet-Draft stage.

#### [0.1.](#) Open issues and work to do

0). Default XML encoding is UTF-8?

1). Do we want data type for numbers?

- 2). I would like to use strong data types. Use NOTATION declaration?
- 3). When use base-64 encoding for attribute values?

Other open issues may be found in the document. They are marked with >>>

## [0.2.](#) Changes from revision 00

- 1). Added attribute for dataset quota.

## [1.](#) Abstract

This document describes a XML DTD suitable for describing application configuration information or modifications made to configuration information. The file format is typically used to import and export configuration information between ACAP servers, or to describe a set of changes which are to be applied to a ACAP database or a set of ACAP databases.

There are a number of situations where a common interchange format is desirable. For example, one might wish to export a copy of the contents of a ACAP server to a file, move that file to a different machine, and import the contents into a second ACAP server. In addition, well-defined interchange format facilitates the development of import or migration tools.

This document describes the interchange format that has the same objective as [LDIF] has for LDAP.

## [2.](#) Conventions used in this document

The key words "MUST", "MUST NOT", "SHOULD", "SHOULD NOT", and "MAY" in this document are to be interpreted as defined in "Key words for use in RFCs to Indicate Requirement Levels" [[KEYWORDS](#)].

When UTF-8 [[UTF8](#)] is referred to in this document, it refers to Unicode version 2.0, and not Unicode version 1.1.

XML elements are enclosed in angle brackets in order to distinguish them from ACAP terms with same names.

## [2.](#) "ACAP in XML" DTD

### [2.1.](#) Basic data types

```
<!ENTITY %HostAndPort "CDATA"  
  -- Host name or IP address  
  -->
```

```
<!ENTITY %URL "CDATA"
```

```

-- ACAP URL as defined in [ACAP]
-->

<!ENTITY %AttrName "CDATA"
-- attribute name as defined in [ACAP]
-->

<!ENTITY %EntryName "CDATA"
-- entry name as defined in [ACAP]
-->

<!ENTITY %FQEntryName "CDATA"
-- fully qualified entry name (e.g. "/personality/user/mel/work") as defined
-->

<!ENTITY %DatasetName "CDATA"
-- dataset name as defined in [ACAP]
-->

<!ENTITY %AcapTime "CDATA"
-- time in the format of modtime as defined in [ACAP]
-->

<!ENTITY %MimeType "CDATA"
-- mime-type as defined in [MEDIA-TYPES]
-->

<!ENTITY %UINT32 "CDATA"
-- unsigned 32 bit integer
-->

```

## [2.2.](#) ACAP servers and ACAP operations

The root element of the DTD described in this document is <acapservers>. It represents the collection of ACAP servers. Each ACAP server is represented by <acap> element. Nested elements represent some ACAP operation (<rename>) or a collection of operations (<delete>, <modify>). There is a one-to-one correlation between ACAP operations which change ACAP database (modify (add or replace), delete, and entry rename) and the names of the elements that describe these operations (<modify>, <delete>, <rename> elements). This correspondence is intentional, and permits a straightforward translation from the described operation to protocol operations.

```

<!ELEMENT acapservers (acap)*>

<!ELEMENT acap (operation)*>

<!ATTLIST acap
  server %HostAndPort; #IMPLIED>

<!ELEMENT operation (modify | delete | rename)*>

```

```
<!ELEMENT modify (dataset)*>
```

```
<!ATTLIST modify
  mode (add | replace) #REQUIRED>
```

Note: If mode is equal to "replace" then entry content (if <entry> element is used) or acl (if <setacl> element is used) is removed first and then all attributes are added.

>>>Maybe add 'add' as the default value?

```
<!ELEMENT dataset (setacl*, entry*)>
```

Note: Dataset attributes (default dataset ACLs, dataset inheritance and other attributes) must be represented as the attributes of the "" entry of a dataset as described in Section 5 of [\[ACAP\]](#). dataset.acl and dataset.acl.<attribute> MUST be represented as <acl> element (see <values> description in [Section 5](#)).

```
<!ATTLIST dataset
  name      %DatasetName;      #REQUIRED -- dataset name
  quota     %UINT32;           #IMPLIED  -- quota limit in bytes, 0 means no quota
-->
```

Note: Although ACAP is missing command for setting quotas, some out of the box utilities can be used by import utility to set them.

Note: Subdatasets of a dataset MUST be represented with dataset/entry element. As the result dataset name in <dataset> element MUST be subdataset of the <dataset> if any. For example, the following ACAP tree

```
  /option/
    site/
      common/
        vendor.MD.Execmail/
          Telemetry
          MainWindow
        vendor.MD.M-Store/
          SASL
```

may be represented as

```
<dataset name="/option/site/common">
  <entry name="vendor.MD.Execmail">
    <dataset name="/option/site/common/vendor.MD.Execmail">
      <entry name="Telemetry">...</entry>
      <entry name="MainWindow">...</entry>
    </dataset>
  </entry>
  <entry name="vendor.MD.M-Store">
    <dataset name="/option/site/common/vendor.MD.M-Store">
      <entry name="SASL">...</entry>
    </dataset>
```

```
    </entry>
  </dataset>
```

```
<!ELEMENT setacl (acl-object, acl)>
```

```
<!ELEMENT acl-object (dataset-name, (attribute-name, entry-name?))
  -- dataset-name MUST be equal or subordinate of the the dataset element
  -->
```

Note: From [\[ACAP\]](#): "acl object" specifies what the ACL applies to. This is a parenthesized list. The list contains just the dataset name when referring to the default ACL for a dataset. The list contains a dataset name and an attribute name when referring to the default ACL for an attribute in a dataset. The list contains a dataset name, an attribute name, and an entry name when referring to the ACL for an attribute of an entry of a dataset.

```
<!ELEMENT dataset-name EMPTY>
```

```
<!ATTLIST dataset-name
  name %DatasetName; #REQUIRED>
```

```
<!ELEMENT attribute-name EMPTY>
```

```
<!ATTLIST attribute-name
  name %AttributeName; #REQUIRED>
```

```
<!ELEMENT entry-name EMPTY>
```

```
<!ATTLIST entry-name
  name %EntryName; #REQUIRED>
```

```
<!ELEMENT rename EMPTY>
```

```
<!ATTLIST rename
  dataset      %DatasetName;      #REQUIRED
  from         %EntryName;         #REQUIRED
  to           %EntryName;         #REQUIRED>
```

Note: Hierarchical rename is not allowed for an entry

```
<!ELEMENT delete (delacl*, fqentry-name*)>
```

```
<!ELEMENT delacl EMPTY>
```

```
<!ATTLIST delacl
  dataset      %DatasetName;      #REQUIRED
  attribute    %AttrName;         #REQUIRED
  entry        %EntryName;        #IMPLIED
  identifier   CDATA              #IMPLIED>
```

```
<!ELEMENT fqentry-name EMPTY>

<!ATTLIST fqentry-name
  name %FQEntryName; #REQUIRED>
```

## [2.3. Entries and Attributes](#)

### [2.3.1. Predefined Attributes](#)

```
<!ELEMENT entry (modtime?, subdataset*, attribute*, dataset*)>

<!ATTLIST entry
  name %EntryName; #REQUIRED -- ACAP Entry name>

<!ELEMENT modtime EMPTY>

<!ATTLIST modtime
  time %AcapTime; #REQUIRED>

<!ELEMENT subdataset EMPTY>

<!ATTLIST subdataset
  href %URL; #REQUIRED>
```

### [1.3.2 Attribute Metadata](#)

Different ACAP attribute metadata items are represented in different ways:

- 1). attribute name is represented as <attribute> element attribute "name"
- 2). attribute acl is represented as <acl> element
- 3). attribute value is represented as one of the following elements : <value>, <multivalue>, <nil> or <default>

```
<!ELEMENT attribute (acl?, (value | value-acl | multivalue | nil | default))>

<!ATTLIST attribute
  name          %AttrName;          #REQUIRED
  mime-type     %MimeType;          #IMPLIED>
```

>>> Does any client will need "size" attribute

```
<!ELEMENT acl (ace)*>

<!ELEMENT ace EMPTY>
```

```
<!-- ATTLIST ace
  identifier CDATA #REQUIRED
  rights      CDATA #REQUIRED-->
```

```
<!-- ELEMENT multivalue (value)*-->
```

```
<!-- ELEMENT value (#PCDATA)*-->
```

```
<!-- ATTLIST value
  encoding (binary | base64) 'binary'-->
```

Note 1: Binary data that contains characters in the range 0x00 - 0x1F MUST be encoded as base-64. The data that contains characters in the range 0x80 - 0xFF must be base-64 encoded already in UTF-8.

Note 2: All symbols that have special meaning in XML MUST be encoded according to the XML specification (for example character '<' must be encoded as &lt;).

```
<!-- ELEMENT value-acl acl
  -- Used for representing dataset.acl and dataset.acl.<attribute>
  -->
```

```
<!-- ELEMENT nil EMPTY-->
```

```
<!-- ELEMENT default EMPTY-->
```

### 3. Examples

Example 1:

```
<acapservers>
  <acap name="acap1.eva.net">
    <modify mode="add">
      <dataset name="/personality/~" >
        <entry name="personal">
          <modtime time="20000403110923Z"/>
          <subdataset href="."/>
            <!-- replicated copy is stored on a different server-->
            <subdataset href="acap://acap2.myserver.net"/>
              <attribute name="personality.File-Into.Local"><value>sent mail</value></attribute>
              <attribute name="personality.Header.Extra"><value>Pet: Yak</value></attribute>
              <attribute name="personality.MIME.Composition-Type"><value>text/enriched</value></attribute>
              <attribute name="personality.Real-Name"><value>L. Eva Message</value></attribute>
              <attribute name="personality.Return-Address"><value>lem@pop.isp.com</value></attribute>
              <attribute name="personality.Server.SMTP"><value>smtp://smtp.isp.com</value></attribute>
              <attribute name="personality.Signature.Text"><value>--
```

```
L. Eva Message</value></attribute>
        </entry>
```

```
</dataset>
```

```
</modify>

</acap>
</acapservers
```

Example 2:

```
<acapservers>
  <acap name="acap1.messagingdirect.com">
    <rename dataset="/personality/user/mel" from="work" to="work1"/>
  </acap>
  <acap name="acap2.messagingdirect.com">
    <modify mode="add">
      <dataset>
        <setacl>
          <acl-object><dataset-name name="/personality/user/mel/work1"/><attribut
          <acl>
            <ace identifier="mel" rights="xrwia"/>
            <ace identifier="mother" rights="r"/>
          </acl>
        </setacl>
      </dataset>
    </modify>
    <delete>
      <delacl dataset="/personality/user/mel" attribute="personality.Return-Add
      <fqentry-name name="/options/user/mel/test"/>
    </delete>
  </acap>
</acapservers
```

#### 4. References

[ABNF] Crocker, Overell, "Augmented BNF for Syntax Specifications: ABNF", [RFC 2234](#), Internet Mail Consortium, Demon Internet Ltd., November 1997. <[ftp://ftp.isi.edu/in-notes/rfc2234.txt](http://ftp.isi.edu/in-notes/rfc2234.txt)>

[ACAP] Newman, Myers, "ACAP -- Application Configuration Access Protocol", [RFC 2244](#), Innosoft, Netscape, November 1997. <[ftp://ftp.isi.edu/in-notes/rfc2244.txt](http://ftp.isi.edu/in-notes/rfc2244.txt)>

[KEYWORDS] Bradner, "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), Harvard University, March 1997. <[ftp://ftp.isi.edu/in-notes/rfc2119.txt](http://ftp.isi.edu/in-notes/rfc2119.txt)>

[URL-BASIC] Berners-Lee, Masinter, McCahill, "Uniform Resource Locators (URL)", [RFC 1738](#), CERN, Xerox Corporation, University of Minnesota, December 1994. <[ftp://ftp.isi.edu/in-notes/rfc1738.txt](http://ftp.isi.edu/in-notes/rfc1738.txt)>

[UTF8] Yergeau, F. "UTF-8, a transformation format of ISO 10646", [RFC 2279](#), Alis Technologies, January 1998.



[<ftp://ftp.isi.edu/in-notes/rfc2279.txt>](ftp://ftp.isi.edu/in-notes/rfc2279.txt)

[MEDIA-TYPES] Freed, Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", [RFC 2046](ftp://ftp.isi.edu/in-notes/rfc2046.txt), Innosoft, First Virtual, November 1996

[<ftp://ftp.isi.edu/in-notes/rfc2046.txt>](ftp://ftp.isi.edu/in-notes/rfc2046.txt)

## 5. Security Considerations

<<To be completed later>>

## 6. Acknowledgments

<<To be completed later>>

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