Collaborative Electronic Records Project

EMAIL PRESERVATION PARSER

User Guide

December 2008

Preface

The Email Preservation Parser was developed as part of the Collaborative Electronic Records Project (CERP). The Rockefeller Archive Center and the Smithsonian Institution Archives partnered in this three-year project to research and implement a system and tools for the preservation of digital records with an emphasis on the special challenge of preserving email. The project was funded in large part by the Rockefeller Foundation.

Contents

Introduction

The Email Preservation Parser is designed for use on a computer workstation by individuals familiar with the normal operation of desktop computers.

This user guide covers those areas necessary for use of the Parser including: 1) the format and structure of the prepared email account; 2) the XML schema used to structure the preserved email account; 3) the operation of the Parser; and 4) the migrated email account and its validation.

The purpose of the Parser is to migrate groups of email records into an XML file that captures the email records in situ, complete with their attachments, i.e., in the organizational context in which they were kept by the email account owner. It is designed to be used with email records groups that have been separated from their original email system and transferred into the custody of an archival organization. In this document, those groups will be referred to as accounts because email messages transferred are typically grouped according to sender/recipient, i.e., the account owner.

Please note, the Parser has been tested in a Microsoft Windows XP Pro (Service Pack 2) environment. All instructions given presume that Windows environment.

The Prepared Account

Account Structure

An email account is hierarchical by default. As it is presented to the Parser, its arrangement will be used by the Parser to capture its hierarchical organization within the preserved account. At a minimum, it will consist of an account level directory with at least one subdirectory that contains email messages. This is referred to as the **account directory tree**.

An example of this minimal structure is seen in an email account where the account owner keeps all of their email in his/her Inbox.
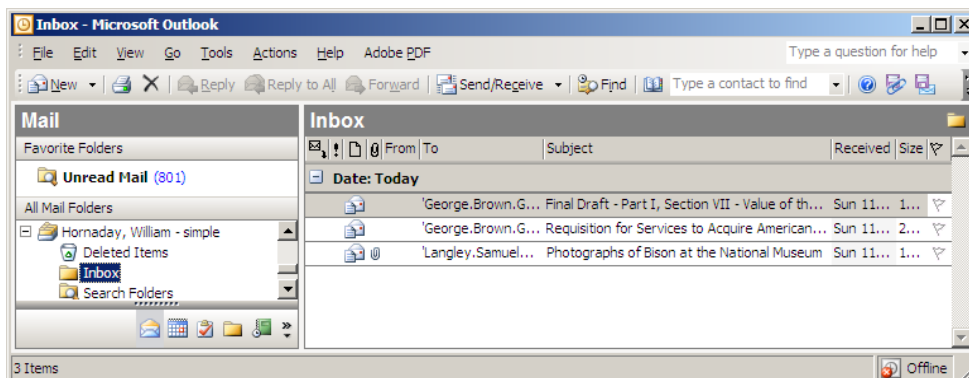
Example 1: Fictitious email account of W.T. Hornaday, Chief Taxidermist of the U.S. National Museum in the 1880s. All emails are located in the "Inbox" directory.

Where the account owner has a more extensive organizational structure, that Inbox would have one or more of its own subdirectories ('grandchildren' of the Account directory,) and so on, and so on. Email messages may or may not be present in any of the directories at or below the Inbox level. See example 2 below.

Whether the account has a minimal structure or one more complex, the account directory itself will have *only* subdirectories. The subdirectories of the account are the first level in which messages can occur.
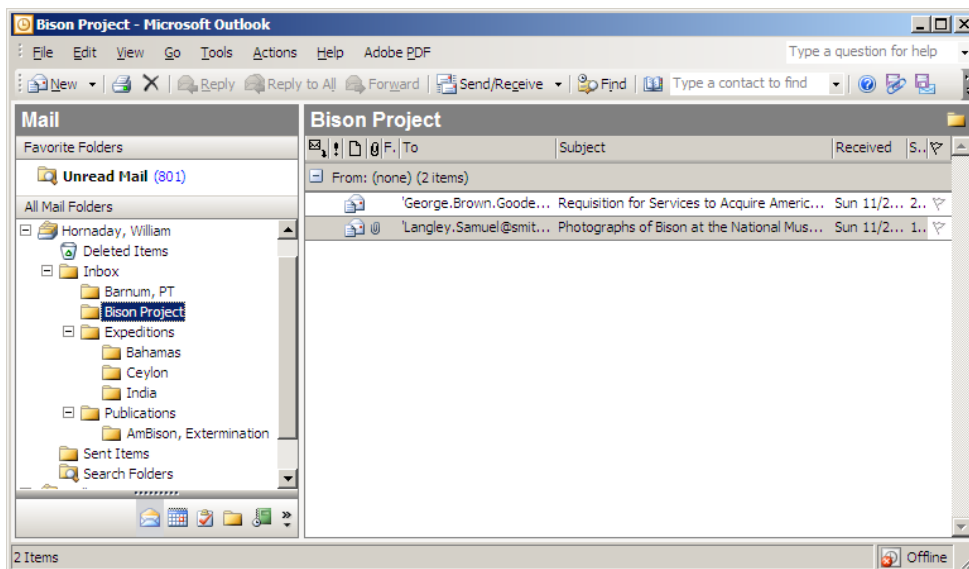
Example 2: Fictitious email account of W.T. Hornaday, Chief Taxidermist of the U.S. National Museum in the 1880s. Emails are located at two levels, in the Inbox sub-directory "Bison Project" and sub-sub-directory (Publications) "AmBison, Extermination."

Email Messages

When the email messages are presented to the Parser, they must be in the **MBOX**[1] email format. This is a generic email format that captures the email message in its entirety – headers, body, and attachments – and supports concatenation of email messages without loss of content.

These aspects of the MBOX format are essential; first because the record of an email message is the complete object in the same sense that a paper-based report may contain a typed narrative, photographs, spreadsheets, etc. Secondly concatenation of messages is particularly useful to group messages according to the subdirectory where they are originally located. Inexpensive software programs are commercially available that will migrate emails from proprietary formats into MBOX and a variety of other formats. The email messages must be grouped into one MBOX file per subdirectory.

Using Example 2 above, the prepared account would appear as shown below when displayed in a Windows Explorer folder view, with the **MBOX** files shown in italics.

- Hornaday_William
    - Inbox
        - Barnum, PT
        - Bison Project
            - *Inbox-Bison Project.mbox*
        - Expeditions
            - Ceylon
            - India
            - Bahamas
        - Publications
            - AmBison, Extermination
                - *Inbox-Publications-AmBison, Extermination.mbox*
    - Sent Items

---

1 More details about the MBOX format can be found at http://en.wikipedia.org/wiki/Mbox.

The Email Parser tool looks at the contents of the Email_Accounts directory for accounts to preserve. Therefore, once the account directory tree and its MBOX files are ready, place it into the **Email_Accounts** directory located inside the EmailParser directory on the workstation. For example:

🗁 - EmailParser

    🗁 - Email_Accounts

        🗁 - Hornaday_William

          …….

The E-Mail[i] Account XML Schema

The EmailParser migrates the account to XML, structuring the resulting file according to the E-Mail Account XML schema. Use of the schema ensures a consistently and reliably structured result that can be tested for completeness when the migration is complete. If the parser's XML output fails to pass validation, then the user will know to discard the results. (Please note: It is recommended that if the parsed XML file fails validation, some inspection be performed on the results to determine the cause.)

The submitted email account is transformed into a single XML file during parsing. Following the XML schema, the Hornaday_William account example used in the previous section would be represented as illustrated in the following table[2, 3]. The directory – subdirectory structure is documented in the nesting structure of XML tags in the document.

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2 This representation is for illustration only and is not a literal depiction of a preserved email account. Several tags have been omitted for the sake of describing the transformation that occurs.
3 A full and complete preserved email account file of this example appears in Appendix A.

Prepared Account Structure

📁 - Hornaday_William

   📁 - Inbox

      📁 - Barnum, PT

      📁 - Bison Project
        📄 - *messages.mbox*

      📁 - Expeditions

        📁 - Ceylon

        📁 - India

        📁 - Bahamas

      📁 - Publications

        📁 - AmBison, Extermin...
          📄 - *messages.mbox*

   📁 - Sent Items

Preserved Account

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Account xmlns="http://www.archives.ncdcr.gov/mail-account"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.archives.ncdcr.gov/mail-account.xsd">
        <GlobalId> 707093423.Account.fake.CERPHandleServer@CERP.org </GlobalId>
<Folder>
        <Name>Hornaday_William</Name>

        <Folder>
            <Name>Inbox</Name>

            <Folder>
                <Name>BarnumPT</Name>
            </Folder>
            <Folder>
                <Name>Bison Project</Name>
                <Message> the first message </Message>
                <Message> the second message </Message>
                <Mbox> the submitted MBOX file </Mbox>
            </Folder>
            <Folder>
                <Name>Expeditions</Name>

                <Folder>
                    <Name>Ceylon</Name>
                </Folder>
                <Folder>
                    <Name>India</Name>
                </Folder>
                <Folder>
                    <Name>Bahamas</Name>
                </Folder>
            </Folder>
            <Folder>
                <Name>Publications</Name>

                <Folder>
                    <Name>AmBison, Extermination</Name>
                    <Message> the first message </Message>
                    <Mbox> the submitted MBOX file </Mbox>
                </Folder>
            </Folder>
            <Folder>
                <Name>Sent Items</Name>
            </Folder>
        </Folder>
    </Folder>
</Account>
```

Parser Pre-Sets

Email accounts can contain a number of items that the Parser has been pre-configured to handle so as to optimize its processing of an account. Some of these settings can be changed; others would require modifications to the Parser's programming. It is important that you are aware of these values prior to parsing so that you can verify the preservation has been successful. The preserved account is addressed in detail later in this document.

The pre-set values are:

Value	Setting	Behavior
Attachment size	> 25 MB	export XML-encoded version into MBOX directory tree; record the exported attachment's location in the preserved account XML file
MBOX message structure	If non-compliant with the MBOX standard	export the bad message into MBOX directory tree in EML format record the exported bad message's location in the preserved account XML file
Processing status update	every 500 messages; when a folder is completed; and when the account is completed	Writes a line to the Web UI interface and the Squeak Transcript screen. And a text file when complete
Report of Summary Messages Fields	From; To; Date; Subject; MessageID; Hash; Errors; First Error Msg;	Writes field values into a file using comma-separated value file format

Using the Parser

The Parser can be used with two different interfaces interchangeably, a web browser interface and the native Squeak interface. For normal use, the web interface may prove the simplest to use since most users are already very familiar with web browser navigation and conventions. Instructions for both are provided here.

Web User Interface

The following steps describe how to use the web interface of the Email Parser.
1. Ensure the prepared email account is located in the Email_Accounts folder.
2. Start Squeak.
   a. From the Windows Taskbar, click on Start, then Run.
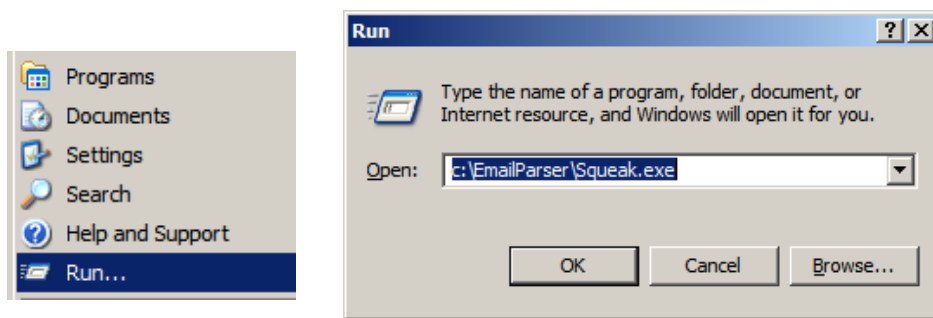
   b. Browse to the EmailParser folder and click on Squeak
   c. Minimize the Squeak window.
3. Open the web browser and go to http://localhost:9091/seaside/EmailParsing/ (case-sensitive)
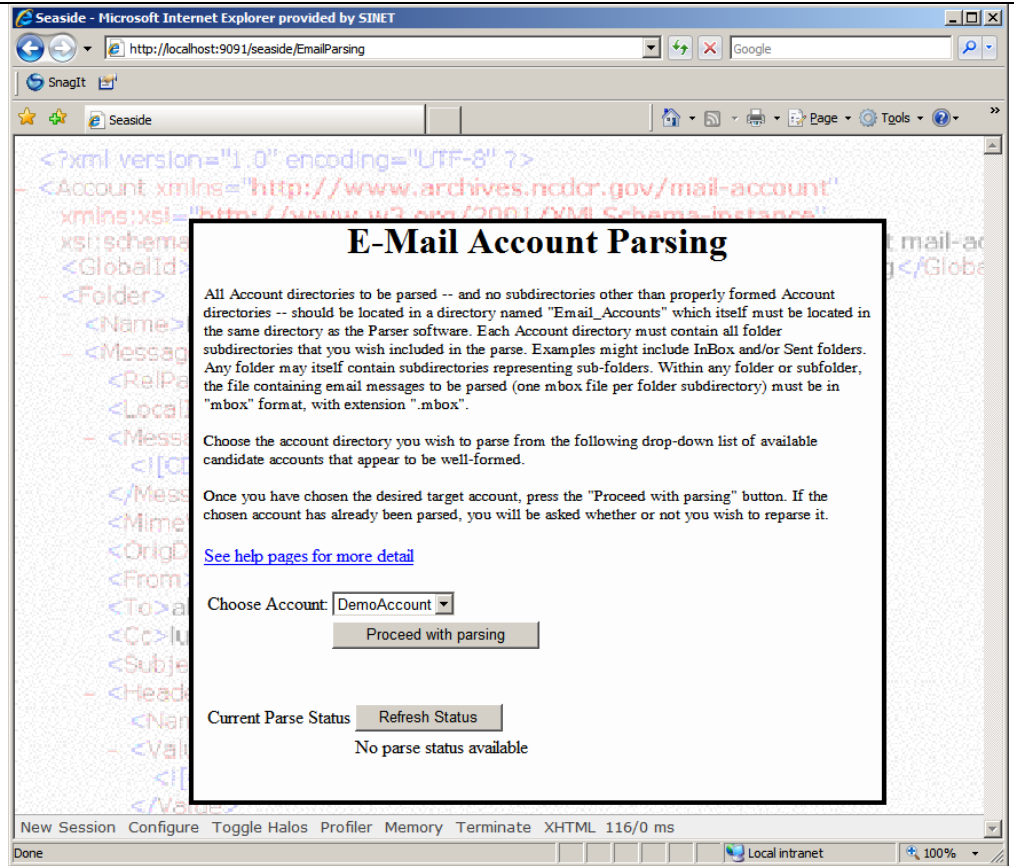
4. In the **Choose Account** drop-down field, select the email account you want to parse.
5. Click " Proceed with parsing"
6. Periodically, click "Refresh Status" to see progress.
7. Scroll down to the bottom of the screen to see the most recent status update. Continue to check periodically until the status indicates that the parser has completed your last top-level folder (example below).

E-Mail Account Parsing

All Account directories to be parsed -- and no subdirectories other than properly formed Account directories -- should be located in a directory named "Email_Accounts" which itself must be located in the same directory as the Parser software. Each Account directory must contain all folder subdirectories that you wish included in the parse. Examples might include InBox and/or Sent folders. Any folder may itself contain subdirectories representing sub-folders. Within any folder or subfolder, the file containing email messages to be parsed (one mbox file per folder subdirectory) must be in "mbox" format, with extension ".mbox".

Choose the account directory you wish to parse from the following drop-down list of available candidate accounts that appear to be well-formed.

Once you have chosen the desired target account, press the "Proceed with parsing" button. If the chosen account has already been parsed, you will be asked whether or not you wish to reparse it.

See help pages for more detail

Choose Account: [DemoAccount ▼]

[Proceed with parsing]

Current Parse Status   [Refresh Status]

Parsing initiated 3 November 2008 for
C:\EmailParser\Email_Accounts\DemoAccount
Begin Parsing: Sent Items at 1:21:12 pm
   Folder contains no mbox file
Begin Parsing: Folder 1 at 1:21:13 pm
   3 messages parsed
Done Parsing: Folder 1 1:22:22 pm
Begin Parsing: Folder 2 at 1:22:22 pm
   3 messages parsed
Done Parsing: Folder 2 1:23:12 pm
Begin Parsing: Folder 3 at 1:23:12 pm
   3 messages parsed
Done Parsing: Folder 3 1:24:15 pm
Begin Parsing: Folder 4 at 1:24:15 pm
   3 messages parsed
Done Parsing: Folder 4 1:24:30 pm
Done Parsing: Sent Items 1:24:30 pm

To parse another account, repeat steps 1 through 7.

Native Squeak Interface

The following steps describe how to use the native Squeak interface of the Email Parser.

1. Ensure the prepared email account is located in the Email_Accounts folder.
2. Start Squeak.
   a. From the Windows Taskbar, click on Start, then Run.
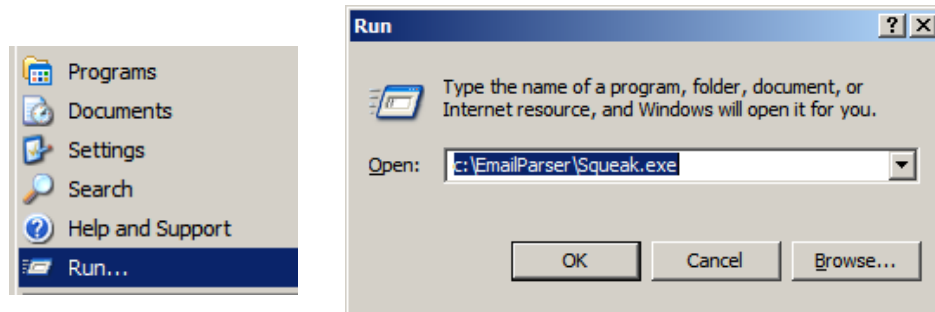
    b. Browse to the EmailParser folder and click on Squeak. You should now see the image above.
    c. Click OK.
3. If the Transcript screen is not already open, click on the Tools tab (right side of the Squeak window) and drag the Transcript screen onto the Squeak window.
4. In the Transcript screen, type **Account selectAndParseAccount** (Note: this command is case-sensitive.)
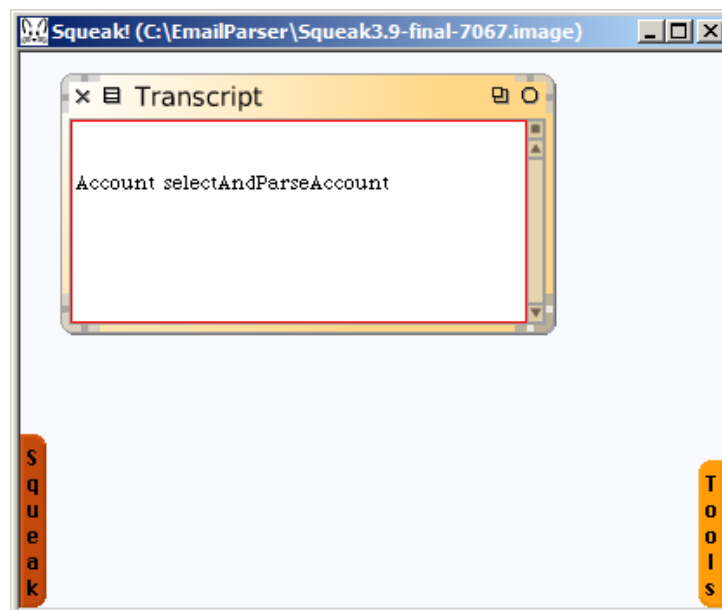
5. Select that line, right-click on it, and choose **do it**.
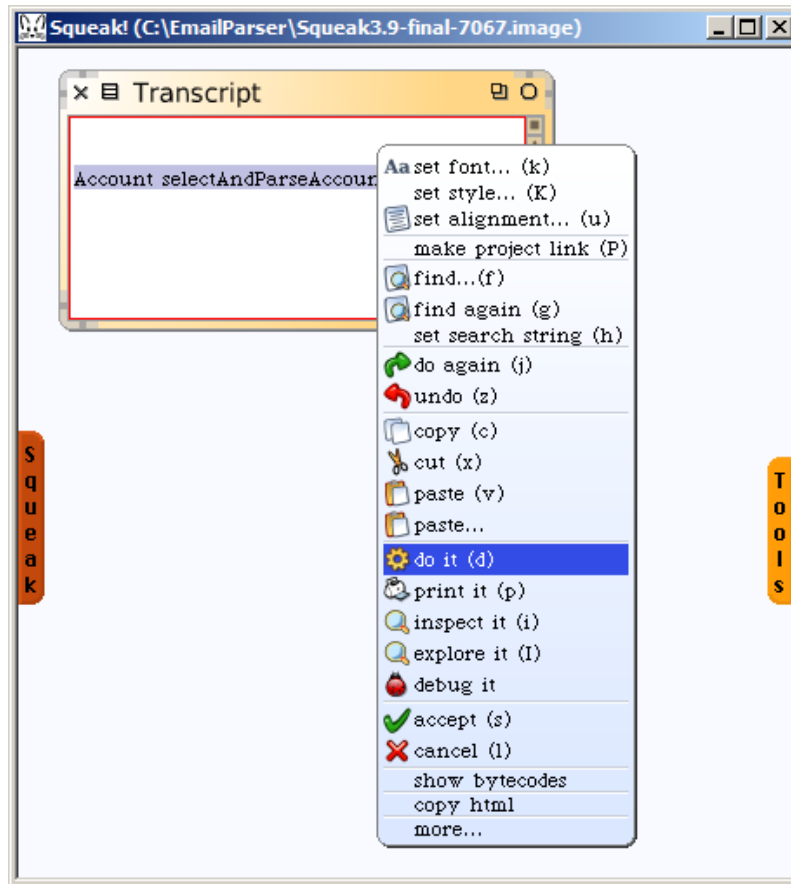
6. In the next screen that appears, navigate to the account folder you wish to parse and click on the green **Accept** button in the bottom right corner.
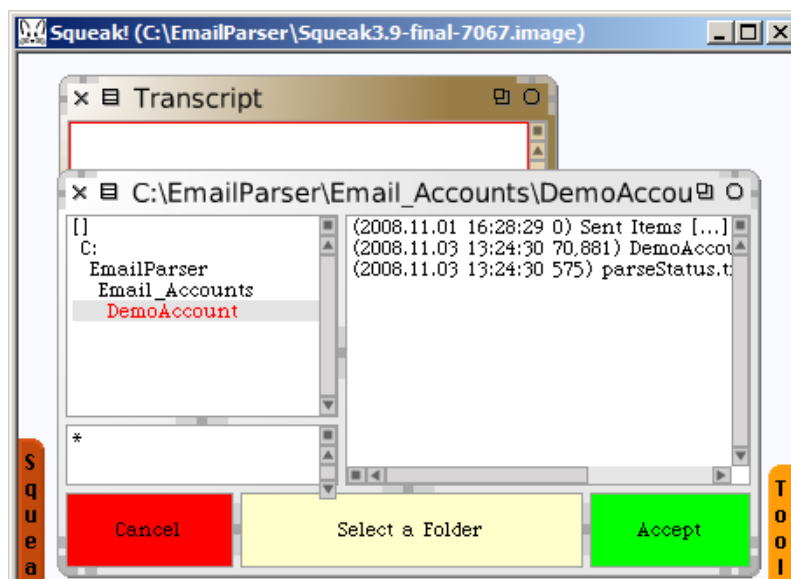
7. The parser will begin working on the selected account. It will automatically post status updates to the Transcript screen.
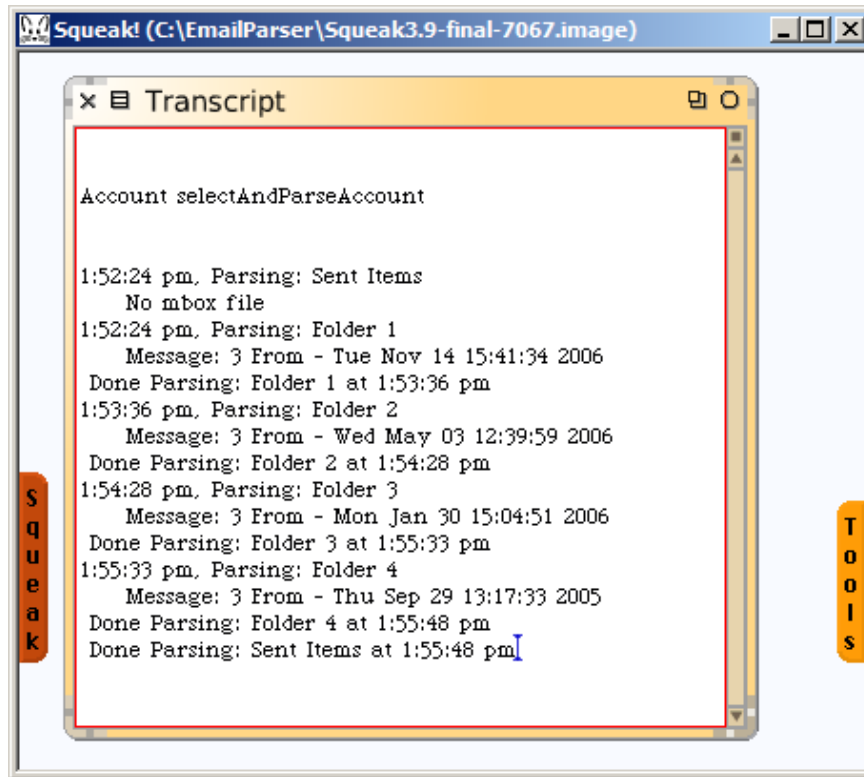
8. Scroll down to the bottom of the screen to see the most recent status update. Continue to check periodically until the status indicates that the parser has completed your last top-level folder (example above).

To parse another account, repeat steps 1 through 7.

# The Preserved Account and other Output

When the Email Parser has finished processing an email account, it will place the preserved account XML file and a number of other files in the Prepared Account's directory. These are:

XML file
This file is the preserved email account, its messages, and all attachments less than 25 Kb in size.

Attachments
According to the pre-set configuration, attachments larger than 25Kb are exported into the prepared account's directory tree and placed in the folder corresponding to the "owning" message. The location of any exported attachment is encoded in the preserved account XML file within its owning message.

Exported attachments have been migrated to XML using base64 encoding in most cases, for ease of access at a later time. This also facilitates giving the exported attachments filenames that are unique to that attachment throughout the preserved account file. In a sizeable email account, it is very likely that several messages have different attachments that are named the same (e.g., policy.doc.) The parser assigns unique files names to all exported attachments using the convention "attach*xxxxxxxxx*.xml" where *xxxxxxxxx* is a randomly generated unique number.

Bad Messages.
Email messages that are not well-formed, that is do not conform to the MBOX data format, are referred to as "bad messages." This may be something as simple as a missing end-of-message marker. Given that a bad message may still contain information and content valuable to a researcher, these messages are kept with the preserved account output in EML format. An entry is made in the MessageSummary.csv (see below) with an indication of the error that caused it and what the first error message was.

MessageSummary.csv

This is a spreadsheet of key fields from the messages found in that particular folder. If it is a bad message, information about the message error is listed here as well. The spreadsheet includes the fields: From, To, Date, Subject, MessageID, Hash, Errors, and First Error Msg. The spreadsheet is in **c**omma-**s**eparated **v**alues (CSV) format which can be read by most spreadsheet software programs.

parseStatus.txt

This text file records each of the status updates sent from the parser to the Web user interface and to the Squeak Transcript screen.

The preserved account and the other parser outputs will appear as illustrated below.

📁 - EmailParser
    📁 - Email_Accounts
        📁 - Hornaday_William
            📄 - ***Hornaday_William.xml***
            📄 - ***parseStatus.txt***
            📁 - Inbox
                📁 - Barnum, PT
                📁 - Bison Project
                    📄 - ***attach132462978.xml***
                    📄 - ***attach147094572.xml***
                    📄 - ***attach503748769.xml***
                    📄 - ***BadMessage423109765.eml***
                    📄 - ***BadMessage742310939.eml***
                    📄 - *messages.mbox*
                    📄 - ***MessageSummary.csv***
            📁 - Expeditions
                📁 - Ceylon
                📁 - India
                📁 - Bahamas
            📁 - Publications
                📁 - AmBison, Extermination
                    📄 - ***attach956762978.xml***
                    📄 - ***attach147663952.xml***
                    📄 - ***attach503763221.xml***
                    📄 - *messages.mbox*
                    📄 - ***MessageSummary.csv***
        📁 - Sent Items

<u>Validating the Preserved Account File</u>

Since the account XML file is structured according to the E-Mail Account schema, you can verify that the parser has created a valid and well-formed file. This validation is recommended and should be incorporated in other quality assurance procedures your organization uses to confirm the integrity and completeness of its archival digital objects.

The schema used to generate the preserved account.XML file is referenced at the beginning of each account.XML file.

```
<?xml version="1.0" encoding="UTF-8"?>
<Account xmlns="http://www.archives.ncdcr.gov/mail-account"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.archives.ncdcr.gov/mail-account.xsd">
```

Because of this, most XML editors can use this reference to locate the E-Mail Account schema if the user's PC has a connection to the Internet. To validate the account.XML file, open it in an XML editor and follow that application's instructions for validating XML files.

Assembling the Email Account Archival Package (AIP)

The information in this section is based on a particular context that may not fully correspond to your organization. The two factors shaping this context are: 1) the CERP partners' definition of the archival digital object, or AIP; and 2) the implementation of this definition in the digital repository environment DSpace.

An archival digital object consists of multiple components referred to together in the OAIS-Reference Model as the Archival Information Package (AIP.) As applied here, the AIP consists of:

Mandatory:
- Original account or email messages in their native format
- Preserved email account
- Descriptive metadata
- Preservation metadata

Optional:
- Finding aid
- Preliminary preservation transformations

- Additional metadata
- Archival Information Package metadata

As implemented in the CERP project, the fictitious William Hornaday email account AIP would include:

Component	File(s) Used for the Component
Original account file	Hornaday_William.PST
Preserved account file	Hornaday_William.XML
Preserved account, addl.	Directory tree including attachments, bad messages, MessageSummary.csv, and MBOX files
Preliminary preservation transformations (MBOX unless MBOX is original)	
Additional Metadata	
Descriptive metadata	Metadata Narrative
Preservation metadata	JHOVE and DROID reports
Finding aid	Hornaday_William_EAD.XML Hornaday_William_EAD.HTML
AIP metadata (METS format)	mets.XML

For archival storage, CERP opted to use the DSpace repository. One of its useful features is the "Multi-Item Title" which could be used to handle AIPs with multiple components. Still, the preserved email account AIP poses a special challenge because its directory tree component is a set of hierarchically related files. DSpace's ability to handle multiple items belonging to a single title does not yet extend to hierarchical relationships between those files. Adjusting to this reality, CERP chose to place sets of the AIP files into uncompressed ZIP-formatted container files. The resulting AIP is outlined below

Component	File(s) Used for the Component
Original account file	Hornaday_William.PST
Preserved account file	Hornaday_William.XML
Preserved account, addl.	Hornaday_William_Directory_Tree.ZIP
Preliminary preservation transformations (MBOX unless MBOX is original)	
Additional Metadata	MessageSummary.ZIP or Subject_sender_log.ZIP
Descriptive metadata	Hornaday_William_Metadata_Narrative.ZIP
Preservation metadata	
Finding aid	Hornaday_William_EAD.ZIP
AIP metadata (METS format)	AIP_mets.xml
METS file for ingest (instructs DSpace how to conduct the ingest)	mets.xml

This group of files is placed in a final, uncompressed ZIP-formatted container file, Hornaday_William_AIP.ZIP for import into DSpace.

Appendix A: The preserved email account file

```
<?xml version="1.0" encoding="UTF-8"?>
<Account xmlns="http://www.archives.ncdcr.gov/mail-account"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.archives.ncdcr.gov/mail-account.xsd">
          <GlobalId> 123691576.Account.fake.CERPHandleServer@CERP.org </GlobalId>
          <Folder>
                    <Name> Inbox</Name>
                    <Folder>
                              <Name> Barnum, PT</Name>
                    </Folder>
                    <Folder>
                              <Name> Bison Project</Name>
                              <Message>
                                        <RelPath>./Hornaday_William/Inbox/Bison Project</RelPath>
                                        <LocalId>1360563584</LocalId>

        <MessageId><![CDATA[<000001c942b3$de8f4400$cc6711ac@US.SINET.SI.EDU>]]></MessageId>
                                        <MimeVersion>1.0</MimeVersion>
                                        <To><![CDATA["Langley.Samuel@smithsonian.org"
<Langley.Samuel@smithsonian.org>]]></To>
                                        <Subject>Photographs of Bison at the National Museum</Subject>
                                        <Header>
                                                  <Name>x-mailer:</Name>
                                                  <Value>Microsoft Office Outlook 11</Value>
                                        </Header>
                                        <Header>
                                                  <Name>thread-index:</Name>
                                                  <Value>Ack9LgPk73AetiKlS1qo8RgfbH2MAA==</Value>
                                        </Header>
                                        <Header>
                                                  <Name>x-mimeole:</Name>
                                                  <Value>Produced By Microsoft MimeOLE V6.00.2900.3350</Value>
                                        </Header>
                                        <MultiBody>
                                                  <ContentType>multipart/mixed</ContentType>
                                                  <BoundaryString>----
=_NextPart_000_0001_01C94289.F5C2B1E0</BoundaryString>
                                                  <Preamble>This is a multi-part message in MIME format.</Preamble>
                                                        <MultiBody>
                                                                  <ContentType>multipart/alternative</ContentType>
                                                                  <BoundaryString>----
=_NextPart_001_0002_01C94289.F5CC4ED0</BoundaryString>
                                                                                <SingleBody>

        <ContentType>text/plain</ContentType>

                                                                                        <Charset>us-ascii</Charset>

        <TransferEncoding>7bit</TransferEncoding>

                                                                                        <BodyContent>
                                                                                                <Content>
-------- FOR EXAMPLE ONLY -------

Dear Secretary,

For your records, I attach the following images of the Great American
Bison exhibit I was asked to mount at the United States National Museum
in 1886-1887. The exhibit is another positive action on the part of the
Smithsonian Institution to communicate the value of this endangered
species, its role in the history of our Nation, and the need for
increased conservation efforts. The general public as well as the
scientific community has responded favorably to the exhibit. It is my
fervent hope that you should continue to show the exhibit for several
more years so that these positive consequences may continue.
```

Sincerely yours,

W. T. Hornaday

```
                                                              </Content>
                                                        </BodyContent>
                                                  </SingleBody>
                                                  <SingleBody>

            <ContentType>text/html</ContentType>

                                                        <Charset>us-ascii</Charset>
                                                        <TransferEncoding>quoted-

printable</TransferEncoding>

                                                        <BodyContent>


            <Content><![CDATA[
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML><HEAD>
<META http-equiv=3DContent-Type content=3D"text/html; =
charset=3Dus-ascii">
<META content=3D"MSHTML 6.00.6000.16705" name=3DGENERATOR></HEAD>
<BODY>
<DIV><FONT face=3DArial size=3D2><SPAN =
class=3D500364920-02112008>-------- FOR EXAMPLE=20
ONLY -------</SPAN></FONT></DIV>
<DIV><FONT face=3DArial size=3D2><SPAN=20
class=3D500364920-02112008></SPAN></FONT> </DIV>
<DIV><FONT face=3DArial size=3D2><SPAN class=3D500364920-02112008>Dear=20
Secretary,</SPAN></FONT></DIV>
<DIV>
<P><SPAN lang=3Den-us><FONT face=3DArial size=3D2><SPAN =
class=3D500364920-02112008>For=20
your records, I attach the following images of the Great American Bison=20
exhibit I was asked to mount at the United States National =
Museum in=20
1886-1887. The exhibit is another positive action on the part of the =
Smithsonian=20
Institution to communicate the value of this endangered species, its =
role in the=20
history of our Nation, and the need for increased conservation efforts. =
The=20
general public as well as the scientific community has responded =
favorably to=20
the exhibit. It is my fervent hope that you should continue to show the =
exhibit=20
for several more years so that these positive consequences may=20
continue.</SPAN></FONT></SPAN></P>
<P><SPAN lang=3Den-us><FONT face=3DArial size=3D2><SPAN=20
class=3D500364920-02112008>Sincerely yours,</SPAN></FONT></SPAN></P>
<P><SPAN lang=3Den-us><FONT face=3DArial size=3D2><SPAN =
class=3D500364920-02112008>W. T.=20
Hornaday</SPAN></FONT></SPAN></P></DIV></BODY></HTML>
]]>
                                                              </Content>
                                                        </BodyContent>
                                                  </SingleBody>
                                        </MultiBody>
                                        <SingleBody>
                                              <ContentType>image/jpeg</ContentType>
                                              <TransferEncoding>base64</TransferEncoding>
                                              <Disposition>attachment</Disposition>
                                              <DispositionFileName>mnh-

16062x.jpg</DispositionFileName>

                                              <ExtBodyContent>
                                                    <RelPath>./attach271531061.xml</RelPath>
                                                    <LocalId>271531061</LocalId>
                                                    <XMLWrapped>true</XMLWrapped>
                                              </ExtBodyContent>
                                        </SingleBody>
```

```xml
                                            <SingleBody>
                                                    <ContentType>image/jpeg</ContentType>
                                                    <TransferEncoding>base64</TransferEncoding>
                                                    <Disposition>attachment</Disposition>
                                                    <DispositionFileName>2004-
10370x.jpg</DispositionFileName>
                                                    <ExtBodyContent>
                                                            <RelPath>./attach219792352.xml</RelPath>
                                                            <LocalId>219792352</LocalId>
                                                            <XMLWrapped>true</XMLWrapped>
                                                    </ExtBodyContent>
                                            </SingleBody>
                                            <SingleBody>
                                                    <ContentType>image/jpeg</ContentType>
                                                    <TransferEncoding>base64</TransferEncoding>
                                                    <Disposition>attachment</Disposition>
                                                    <DispositionFileName>MNH-
4323x.jpg</DispositionFileName>
                                                    <BodyContent>
                                                            <Content>
```

/9j/4AAQSkZJRgABAgEASABIAAD/7RQWUGhvdG9zaG9wIDMuMAA4QklNA+0AAAAAABAASAAAAAEA
------------------ This is the partial code of an embedded image attachment to this message ----------------------------
----------------- The majority of the image attachment's code was removed for ease of display---------------------------
AQBIAAAAAQABOEJJTQPzAAAAAAAIAAAAAAAAAE4QklNBAoAAAAAAAEAADhCSU0nEAAAAAAACgAB
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    SMITHSONIAN INSTITUTION

    UNITED STATES NATIONAL MUSEUM
Washington, Dec 2, 1887

Prof. G. Brown Goode.
    Assistant Secretary Smithsonian Institution
    In charge of the National Museum
      Sir: --
    I desire to respectfully call your attention to the fact that
the United States Government has thus far taken no special measures
whatever for the preservation of the Great American Bison, either in
confinement or on a public reservation. Until very recently we have had
reason to believe that the band of buffaloes known to be in the
Yellowstone Park was adequately protected, and that the animals
composing it were breeding in real security. From the reports that have
been published we have been led to believe that there are between 100
and 125 head of buffaloes in the Park.
    While recently in the vicinity of the National Park I learned
from competent and reliable sources that the buffaloes in the Park have
been killed off as they wandered out or were driven out of the Park
limits, until now it is the general belief amongst those most interested
that not over twenty head remain! It is a well known fact that a number
of hunters, some of whom distinguished themselves in past years in the
slaughter of buffalo, have been, and are now living along the Park
boundaries on the East and South for the purpose of killing buffaloes
and other game that wanders out of the reservation, or can be safely
frightened out. In Mandan, Dak. I saw the heads of two Park Buffaloes,
and in Helena, Montana three out of a lot of six more, that had been
killed by those worthies, some of whom I could name. The six heads in
Helena had been hidden in the snow all winter, in order to keep them
from the eyes of law officers, and had been mutilated by coyotes.
    The fact that the game in the Park is not adequately
protected, is notorious. While there is no doubt that the troop charged
with police duty is vigilant and active, and well directed, the force is
entirely too small, and not sufficiently provided with posts of
rendezvous to cover the ground which should be covered. In winter the
men all retreat to the hotels, which are the only winter quarters
provided, and the best game districts of the park are thus left entirely
without protection, and for quite a long period. It would seem that a
wire fence eight feet high is imperatively needed around the entire
park, and I respectfully submit the question whether it is not the duty
of the Smithsonian Institution to memorialize Congress on this point at
the next session. With the entire park so enclosed, it would be a
comparatively easy matter to make of it the greatest game preserve in
the world.
    In view of the fact that thus far this government has done
nothing to preserve alive any specimens of the American Bison, the most
striking and conspicuous species on this continent, I have the honor to
propose that the Smithsonian Institution, or the National Museum, one or
both, take immediate steps to procure either by gift or purchase, as may
be necessary, the nucleus of a herd of live buffaloes. Having been
spared the misfortune, thanks to the Smithsonian Institution, of being
left without a series of skins and skeletons of the species suitable for

the wants of the National Museum, it now seems necessary for us to assume the responsibility of forming and preserving a herd of live buffaloes which may, in a small measure, atone for the national disgrace that attaches to the heartless and senseless extermination of the species in a wild state.

There are quite a number of buffaloes alive in captivity in the hands of private individuals, and a few more in publics parks and gardens. Those in the hands of private owners are in many instances being allowed to cross with domestic breeds, and it is to be feared that it will soon become a difficult matter to find a buffalo of absolutely pure breed. Is it not only desirable but imperative that we should have a herd fit to be shown as one belonging to the National Government, and one not to be equaled by that of any private individual? It is unnecessary for me to do more than refer to the painstaking and severe manner in which the last surviving herds of Aurochs has for years been protected in the forest of Bialowskza, in Lithuania, by the Emperor of Russia, to prove the degree of interest which other governments manifest in such questions as that now before us.

It seems to me that we should have from six to ten buffaloes as a nucleus for a herd worthy of the name, and also that the animals should be procured immediately. I have ascertained by correspondence the various prices at which private parties would sell some of their stock, and I submit a few letters herewith which will serve well to show the high value already set on these animals. While several parties ask $500 each for buffaloes, and some refuse to sell females at any price, I believe that by prompt action it will be possible to secure what we need at about $100. per head, plus the expenses of transportation. But the price is steadily & very rapidly advancing, and in another year it may be impossible to find a buffalo of any size for sale at less than double its present price.

In view of all the foregoing facts, I now respectfully urge that immediate steps be taken in the matter. I am ready to undertake the task of procuring the animals needed, and providing for them here, if called upon, and provided with the funds that will be necessary.

I think it might prove profitable, in case anything can be done, to engage Mr. M.C. Rousseau (see letter) at once, at a maximum cost of $15. to visit the man mentioned in his letter and ascertain the lowest price at which ten head of buffaloes can be bought on the spot. In order to definitely present the matter, I have the honor to enclose a requisition for the services of Mr. Rosseau immediately.

Respectfully submitted
W. T. Hornaday

_____

William Temple Hornaday to U.S. National Museum Director George Brown Goode, December 2, 1887, Smithsonian Institution Archives, Record Unit 201, Box 17, Folder 10

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W. T. Hornaday

The Extermination of the American Bison: a machine-readable transcription.

VIII. Value of the Buffalo to Man.

It may fairly be supposed that if the people of this country could have been made to realize the immense money value of the great buffalo herds as they existed in 1870, a vigorous and succesful effort would have been made to regulate and restrict the slaughter. The fur { insert photograph here } seal of Alaska, of which about 100,000 are killed annually for their skins, yield an annual revenue to the Government of $100,000, and add $900,000 more to the actual wealth of the United States. It pays to protect those seals, and we mean to protect them against all comers who seek their unrestricted slaughter, no matter whether the poachers be American, English, Russian, or Canadian. It would be folly to do otherwise, and if those who would exterminate the fur seal by shooting them in the water will not desist for the telling, then they must by the compelling.

The fur seal is a good investment for the United States, and their number is not diminishing. As the buffalo herds existed in 1870, 500,000 head of bulls, young and old, could have been killed every year for a score of years without sensibly diminishing the size of the herds. At a low estimate these could easily have been mad to yield various products worth $5 each, as follows: Robe, $2.50; tongue, 25 cents; meat of hind-quarters, $2, bones, horns, and hoofs, 25 cents; total, $5. And the amount annually added to th wealth of the United States would have been $2,500,000.

On all the robes taken for the market, say, 200,000, the Government could have collected a tax of 50 cents each, which would have yielded a sum doubly sufficient to have maintained a force of mounted police fully competent to enforce the laws regulating the slaughter. Had a contract for the protection of the buffalo been offered at $50,000 per annum, ay, or even that sum, an army of competent men would have competed for it every year, and it could have been carried out to the letter. But, as yet, the American people have not learned to spend money for the protection of valuable game; and by the time they do learn it, there will be no game to protect.

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revenue=20
to the Government of $100,000, and add $900,000 more to the actual =
wealth of the=20
United States. It pays to protect those seals, and we mean to protect =
them=20
against all comers who seek their unrestricted slaughter, no matter =
whether the=20
poachers be American, English, Russian, or Canadian. It would be folly =
to do=20
otherwise, and if those who would exterminate the fur seal by shooting =
them in=20
the water will not desist for the telling, then they must by the=20
compelling.</FONT> </FONT>
<P><FONT face=3DArial size=3D2>The fur seal is a good investment for the =
United=20
States, and their number is not diminishing. As the buffalo herds =
existed in=20
1870, 500,000 head of bulls, young and old, could have been killed every =
year=20
for a score of years without sensibly diminishing the size of the herds. =
At a=20
low estimate these could easily have been mad to yield various products =
worth $5=20
each, as follows: Robe, $2.50; tongue, 25 cents; meat of hind-quarters, =
$2,=20
bones, horns, and hoofs, 25 cents; total, $5. And the amount annually =
added to=20

th wealth of the United States would have been $2,500,000.</FONT></P>
<P><FONT face=3DArial size=3D2>On all the robes taken for the market, =
say, 200,000,=20
the Government could have collected a tax of 50 cents each, which would =
have=20
yielded a sum doubly sufficient to have maintained a force of mounted =
police=20
fully competent to enforce the laws regulating the slaughter. Had a =
contract for=20
the protection of the buffalo been offered at $50,000 per annum, ay, or =
even=20
that sum, an army of competent men would have competed for it every =
year, and it=20
could have been carried out to the letter. But, as yet, the American =
people have=20
not learned to spend money for the protection of valuable game; and by =
the time=20
they do learn it, there will be no game to=20
protect.</FONT></P></DIV></BODY></HTML>
]]>
                                                        </Content>
                                                    </BodyContent>
                                                </SingleBody>
                                        </MultiBody>
                                        <Eol>CRLF</Eol>
                                        <Hash>

            <Value>1214FDDF61F1118F84BD816A2A08344CB3B4D7F4</Value>
                                                <Function>SHA1</Function>
                                        </Hash>
                                </Message>
                                <Mbox>
                                        <RelPath>./Hornaday_William/Inbox/Publications/AmBison,
Extermination</RelPath>
                                        <Eol>CRLF</Eol>
                                </Mbox>
                        </Folder>
                </Folder>
        </Folder>
</Account>

Appendix B: Troubleshooting Tips

Issue: Parser Does Not Complete Processing the Email Account

Improperly-formatted messages may be present. This could be as simple as a message missing an end-of-message marker or something more severe. If the message or its attachments has this type of problem, the parser will try to record it in the MessageSummary log file. Consult the appropriate log file to find entries of bad messages that may be the cause of the problem.

If there is not a BadMessage entry in the Message Summary log, check for a TempMessage file left in the folder directory. That message will be the one that was being parsed when the parser was forced to abort. TempMessage files are deleted as soon as each message has been completely parsed into XML.

Take the appropriate steps to remove those messages from the email account, re-generate the MBOX file, and attempt to parse again.

If the parser is unable to complete parsing the account on this second attempt, it is likely that there are other bad messages that occur after the bad message that forced it to abort the first time. You may need to go through these steps repeatedly if this is the case.

Remember to document what you have done as part of the email account's Preservation Description Information (PDI).

PC's virus checking software is set to scan every file accessed. In some cases, virus protection applications like MacAfee, Norton AntiVirus, and Kapersky may detect a virus in the email being parsed and will stop the process. This is not caused by the parser, but by the virus checking application. What is likely happening is that the virus checker is detecting a virus in an attachment embedded in the MBOX file before the parser has generated the XML-formatted account.

Try turning off the virus checking software before running the parser. Remember, best practices for digital preservation recommend working in an isolated environment, disconnected from networks. This virus checking behavior is well-known and is the reason many commercial applications tell the user to turn off their anti-virus applications when installing software.

The parser is still a prototype. While we have tested the parser with a variety of email formats, the fact is that there are many more formats out there that we have not encountered yet.

To date, the email data standards give a lot of leeway in how an email system vendor complies, and frankly email functionality has consistently outpaced updates to the standard. That results in message formats and functionality that are outside the standard.

We've discovered a lot of these types of things in the formats we have worked with. Not surprisingly, spam email messages are another frequent source of mal-structured content. In either case, one of the most frequent areas where we have found improperly formatted content is in date fields. We have enhanced the parser to recognize the things we have encountered and to handle them appropriately.

The reality of the situation is that we haven't run across all the formats out there. Therefore, we consider the parser to be a prototype solution.

Issue: "Do It" Command in Squeak Interface is Blocked by Windows Firewall

If the Windows Firewall presents an option to unblock, choose to do so. This will not turn off the Windows Firewall application.

If the Windows Firewall does not present an option to unblock, go to the Windows Security Center and temporarily turn off the Windows Firewall application. Before doing so, confirm that the PC is disconnected from the network. Turn the Windows Firewall back on after parsing is complete. Then reconnect the PC to the network if desired.

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[i] Technical documentation of the E-Mail Account XML schema is available at http://www.archives.ncdcr.gov/mail-account.