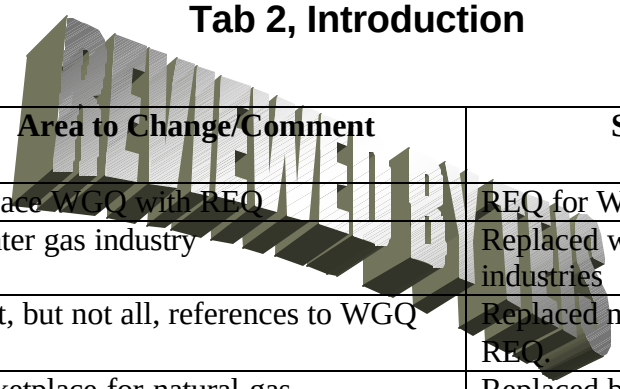
CHANGE LOG

Tab 2, Introduction



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18	TAB 7, TAB 8, TAB 9 and TAB 10	Replaced with TAB 7 Testing Guidelines and TAB 8 Appendix
18	Appendix C and Appendix D	Eliminated, and renamed Appendix E to Appendix C

CHANGE LOG

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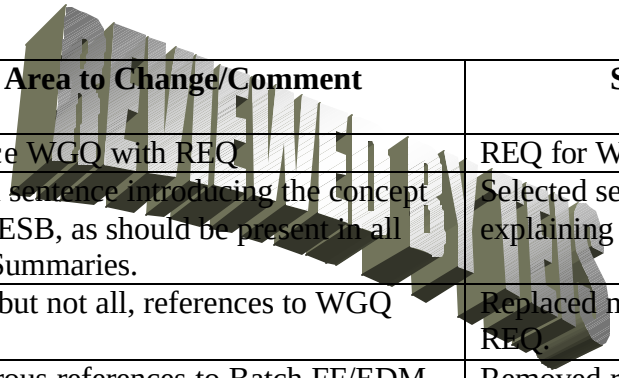

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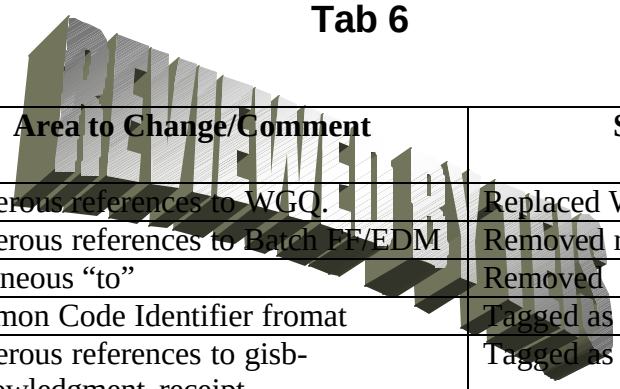

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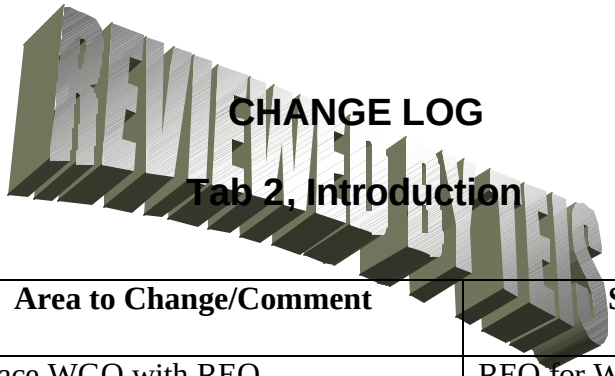

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INTRODUCTION

The North American Energy Standards Board (NAESB) is a voluntary non-profit organization comprised of members from all aspects of the greater gas and electric industries. NAESB Retail Electric Quadrant (REQ) Standards are a product of the North American Energy Standards Board. The NAESB mission is to take the lead in developing and implementing standards across the industry to simplify and expand electronic communication, and to streamline business practices. This will lead to a seamless North American marketplace for energy, as recognized by its customers, the business community, industry participants and regulatory bodies.

The standards are written as 'minimums,' which industry participants are encouraged to exceed (if they are not doing so already) through provision of value-added services and customized arrangements. NAESB defines 'exceed the minimum standard' to mean surpassing the standards without negative impact on contracting and non-contracting parties.

All of the standards have been adopted in the realization that as the industry evolves and uses the standards, additional and amended NAESB standards will be necessary. Any industry participant seeking additional or amended standards (including principles, definitions, standards, data elements, process descriptions, technical implementation instructions) should submit a request to the NAESB office, detailing the change, so that the appropriate process may take place to amend the standards.

TAB 1 Version Notes

Contains notes about this version, and, if appropriate, a brief summary of changes from the immediately preceding version.

TAB 2 Introduction

Provides a background statement about NAESB's Mission and the underlying concepts behind the design and use of this guide.

TAB 3 Executive Summary

Provides a brief outline of the industry business situation which is the basis for development of this guide.

TAB 4 Business Process & Practices

Provides a brief overview of the business process and the NAESB REQ approved principles, definitions and standards related to the business process covered by this guide.

TAB 5 Related Standards

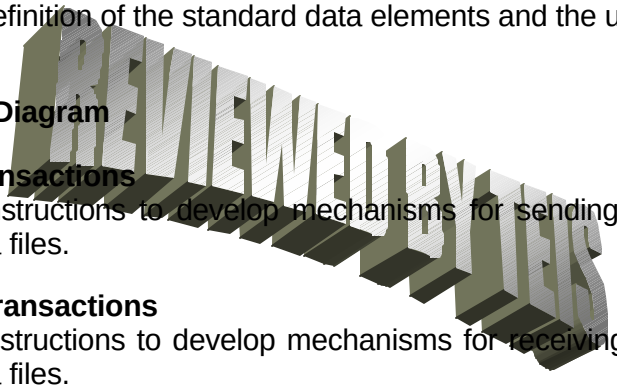
Provides a reference to any related standards.

TAB 6 Technical Implementation - Electronic Delivery Mechanism (EDM)

Provides an overview of the business process for EDM.

Data Dictionary

Provides definition of the standard data elements and the usage requirements for each element.



Batch Flow Diagram

Sending Transactions

Provides instructions to develop mechanisms for sending of NAESB REQ standard format data files.

Receiving Transactions

Provides instructions to develop mechanisms for receiving of NAESB REQ standard format data files.

Security

Provides guidelines for data privacy, data integrity, authentication and non-repudiation of inbound and outbound transactions.

Other Considerations

Provides information regarding error notification and testing. Includes a reference guide and examples for repudiation and validation.

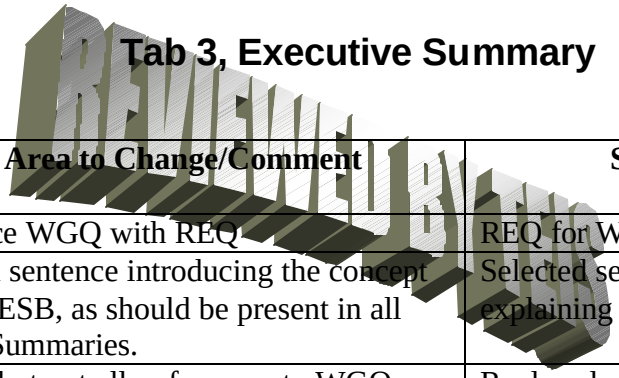
TAB 7 Testing Guidelines

TAB 8 Appendix

Appendix A - Reference Guide
Appendix B - Repudiation and Validation Examples
Appendix C - Minimum Technical Characteristics for an EDM Server+

CHANGE LOG

Tab 3, Executive Summary



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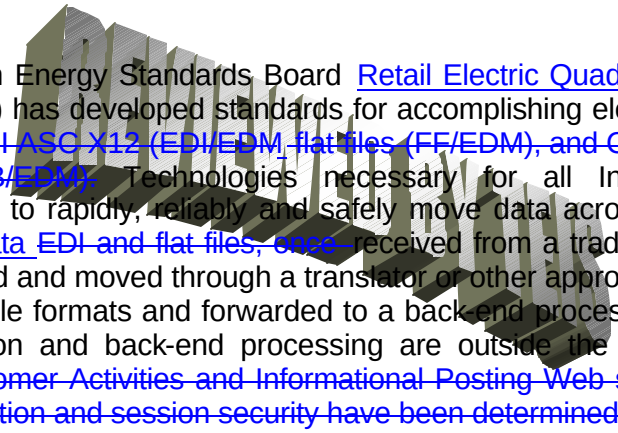
EXECUTIVE SUMMARY



The North American Energy Standards Board Retail Electric Quadrant ~~Whole Gas Quadran~~t (NAESB REQ~~WGQ~~) has developed standards for accomplishing electronic commerce over the Internet. ~~using ANSI ASC X12 (EDI/EDM), flat files (FF/EDM), and Customer Activities Web site presentations (EBB/EDM).~~ Technologies necessary for all Internet Electronic Delivery Mechanisms (EDM) to rapidly, reliably and safely move data across the Internet have been determined. For data ~~EDI and flat files, once~~ received from a trading partner via the Internet, the data is decrypted and moved through a translator or other appropriate processor for NAESB ~~WG~~REQ standard file formats and forwarded to a back-end processing application. However, file format translation and back-end processing are outside the Internet EDM scope. ~~For NAESB WGQ Customer Activities and Informational Posting Web sites, requirements for data presentation, navigation and session security have been determined~~.

This document is a high-level guide to implementing various technologies necessary to communicate transactions using the standard protocols. As such, this guide is not intended to be a comprehensive, in-depth manual. Wherever possible, this guide points to more in-depth material. The Reference section provides locations on the Internet to obtain more information as well as books and periodicals that have been recommended.

Open Standards

There are several major topic areas related to Internet Electronic Delivery Mechanism covered in this manual. When looking to implement Internet EDM, one should become familiar with the following components of the implementation:

Communications Protocols

Sending of Transactions

Receipt of Transactions

Security

HTTP Transport for Secure EDI (a.k.a. IETF EDIINT AS2)

The "open" standard technologies selected by NAESB ~~WG~~REQ to address these areas are designed to provide flexibility and scalability. There are business benefits gained from adherence to "HTTP Transport for Secure EDI" such as:

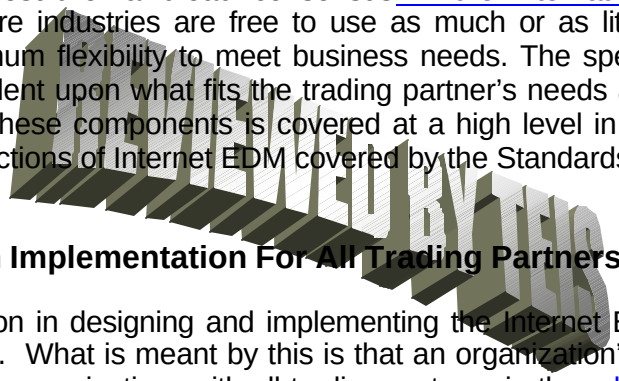
Allows potential to more readily, electronically trade with others (e.g., ~~electric~~ gas utilities, financial institutions~~banks~~, suppliers, retail customers)

Makes it more likely that packages can be purchased to replace custom written applications~~s~~ currently in place to support NAESB ~~WGQ~~ REQ EDM

Strengthens the surety of receipt and error notification

HTTP Transport for Secure EDI (AS2) is an emerging standard, largely based on the original

NAESB WGQ EDM, that is being developed by the Internet Engineering Task Force, the Internet standards body. Adherence with a formal, international Internet standard, such as AS2 ensures that the specification will not change without due process and any changes that do occur will be the result of a broad consensus in the international community. Individual companies and entire industries are free to use as much or as little of AS2 as they see fit, providing the maximum flexibility to meet business needs. The specific implementation of the standards is dependent upon what fits the trading partner's needs and available resources. A brief delineation of these components is covered at a high level in the Business Process and Practices (Major functions of Internet EDM covered by the Standards) section and in more detail in later sections.



Same Application Implementation For All Trading Partners

The basic assumption in designing and implementing the Internet EDM application is that it is not platform-specific. What is meant by this is that an organization's Internet EDM application serves the role of communicating with all trading partners in the electric ~~gas~~ industry no matter what hardware, operating system and programming languages they use at their site. For this reason, testing with other trading partners with a variety of platforms is very important in ensuring that each~~your~~ EDM application is compatible with a range of platforms used by various trading partners.

Testing With Electric ~~Gas~~ Industry Internet EDM Participants

(THIS SECTION NEEDS TO BE REWRITTEN REFERRING TO OUR GUIDELINES (1 16 03)

To provide a way for parties interested in Internet EDM testing to initiate testing relationships, the NAESB home page will have a list of organizations willing to act as testing partners and their respective test coordinator. – The Future Technology Task Force (FTTF) meets on an intermittent basis be scheduled teleconference or in-person meetings to discuss issues, problems, further refinement of the standards. These discussions will provide a means to benchmark results and provide feedback to each other on possible enhancements to the participants' implementations. The FTTF realized that the technology being implemented is relatively new and all organizations can benefit from the sharing of research and technical information and the resolution of gas business issues integrated with the new technologies.

Importance of the Trading Partner Agreement When Using EDM

The expectations of who will perform what function and how it will be accomplished in Internet EDM should, at some level, be laid out in the trading partner agreement. This clarification in the agreement would help to expedite a smoother communication between the trading partners when first setting up their Internet EDM relationship. The newness of the Internet EDM standards and the various implementations of the applications between trading partners bring to the forefront a quandary of issues related to establishing the business rules associated with these standards. The specifications in the trading partner agreement should be tested before production implementation to formulate a solution to any problems revealed during testing well before reliance on the implementation.

Concerns About Future Reliability of the Public Internet

The Internet has proven its viability as a business communication method in many different

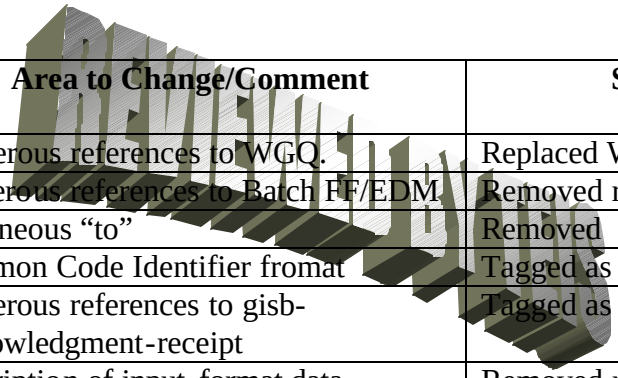
industries, but ~~Continued~~ monitoring of the Internet's viability as a communications medium~~n infrastructure~~ will continue to take place. Increased traffic and potential lack of sufficient transmission capacity on the Internet is difficult to predict and quantify at this time. Concerns may be resolved by new Internet service providers and new communications technologies to compensate for the rapid growth of the Internet.

Further Information

Please see the NAESB home page at http://www.naesb.org/ for additional useful information on the implementation of Internet EDM.

CHANGE LOG

Tab 6



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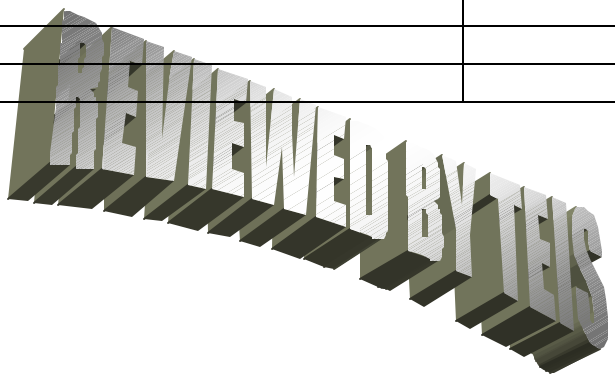
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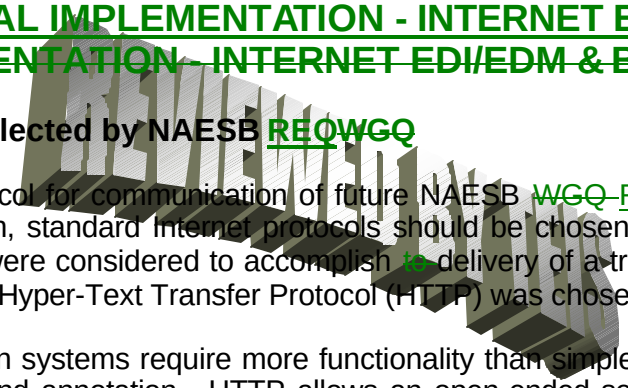
TECHNICAL IMPLEMENTATION - INTERNET EDM~~TECHNICAL IMPLEMENTATION - INTERNET EDI/EDM & BATCH FF/EDM~~



Technologies Selected by NAESB REQ~~WGQ~~

The transport protocol for communication of future NAESB ~~WGQ~~ REQ transactions should be TCP/IP. In addition, standard Internet protocols should be chosen for specific tasks. Various Internet protocols were considered to accomplish ~~to~~ delivery of a transaction at the application protocol level. The Hyper-Text Transfer Protocol (HTTP) was chosen.

Practical information systems require more functionality than simple retrieval, including search, front-end update, and annotation. HTTP allows an open-ended set of methods to be used to indicate the purpose of a request. HTTP is also used as a generic protocol for communication between user agents and proxies/gateways to other Internet protocols, allowing basic hypermedia access to resources available from diverse applications and simplifying the implementation of user agents.

There are two primary Internet software components involved in Web communications. The first is called a browser and runs as client software. The second is called a Web server, or HTTP server and usually runs on a dedicated server computer.

The standard data elements, each with element name and description, have been defined in the Section "Data Dictionary For Internet EDM". The following two sections identify what is involved in sending and receiving transactions. After that comes a discussion regarding the securing of the transactions to be sent. The remaining sections cover considerations for other aspects of the overall process. While these were not the focus of the Internet EDM process as mentioned above, selected topics that may affect your overall implementation are discussed.

Data Dictionary For Internet EDM

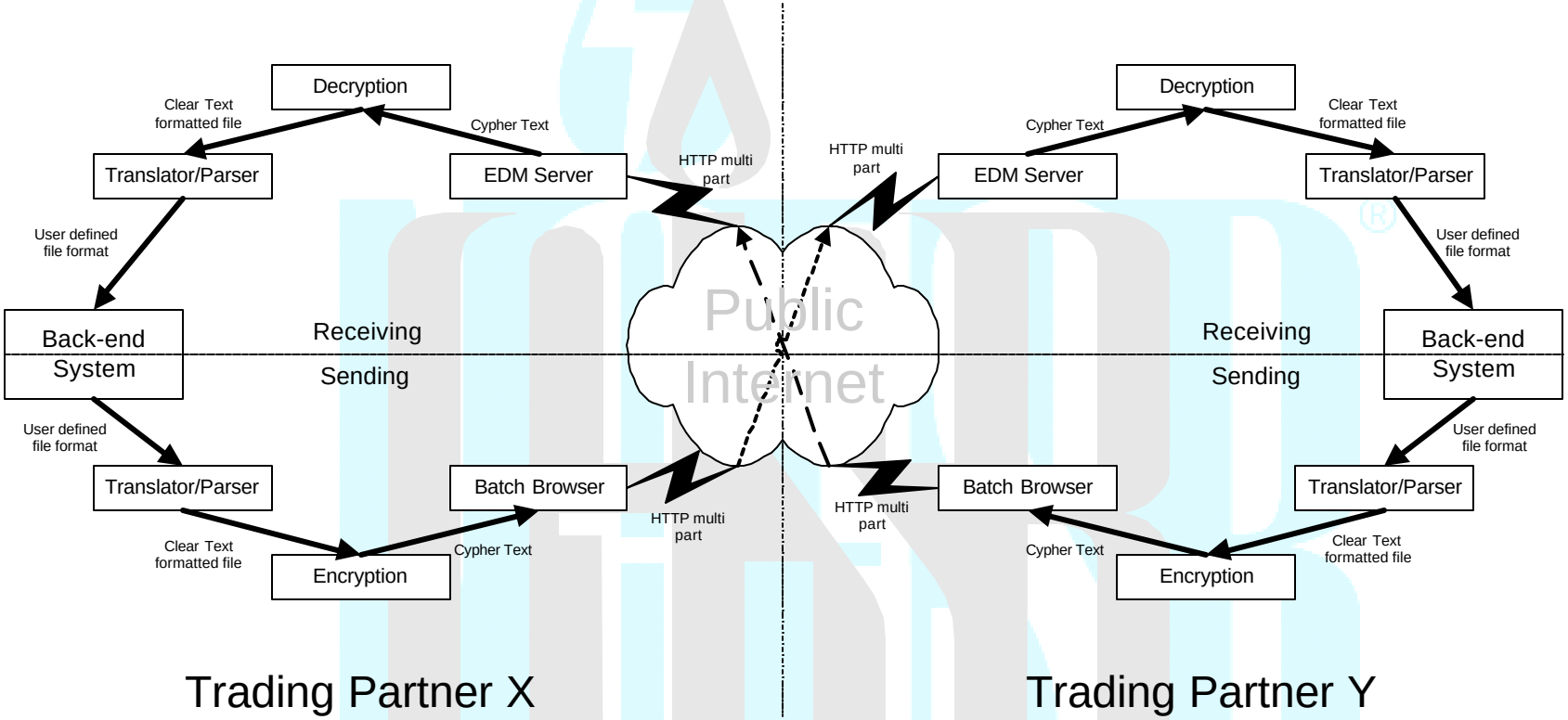
Business Name	Definition	Format	Usage*	Condition
from**	the party sending the transaction	Common Code Identifier format (OPEN ISSUE 001)	in Request; M	used in file transmittal; displayed in HTTP response; and, used in posting back decryption-related errors
input-data	the filename for the transaction data set transmitted	including drive letter and directory name with filename if needed	in Request; M	used in file transmittal of any transaction data sets; and, used for posting back all transaction value pairs for a transmittal that had decryption-related errors.
input-format	descriptor of the data format used for the file transmitted	X12 ;XML;~~FF;~~error	in Request; M	"X12",~~"XML",~~ ~~"FF",~~ or other NAESB REQ~~WGQ~~ standard format indicator used in file transmittal; "error" used in posting back any decryption-related errors
receipt-disposition-to	the party to receive receipts, t~~he~~he value should be the same as the "from"	Common Code Identifier format (OPEN ISSUE 001)	in Request; M	used in file transmittal and in posting error notifications
receipt-report-type	type of receipt type being requested by sender	gisb-acknowledgement-receipt (OPEN ISSUE 002)	in Request; M	used in file transmittal and in posting error notifications
receipt-security-selection	used to request signed receipts	signed-receipt-protocol=required,pgp-signature;signed-receipt-micalg=required,md5	in Request; MA	used in file transmittal and in posting error notifications
refnum	used by the party to assign a unique message identifier for tracing purposes	maximum 40 character integer value	in Request; MA	May be used by sender to send tracking information to a recipient. Use of this data element is by mutually agreed. This data element is conceptually similar to a Message-ID filed within RFC 822.
request-status	status describing success or failure of transmission at recipient server	ok; EEDM###:error description; WEDM###:warning description. see Table A, "Internet EDM Standard Error Codes and Messages"	in Response; M	"ok" is returned if all is fine with ~~the CGI/script~~ processing; error messages/warnings and their related descriptions are returned if problems were encountered in ~~CGI/script~~ processing~~.or in the decryption process.~~
server-id	uniquely identifies the server ~~and CGI/script~~ processing the transaction	*domainname* or *hostname.domainname*; no embedded spaces allowed	in Response; M	displayed in the HTTP response and posted back for any decryption-related errors
time-c	the time file transfer is complete at the server, where + or –ZZ indicates delta from UTC (ref ISO 8601)	~~Y~~*yyyymmddhhmmss-ZZ; yyyymmddhhmmss+ZZ* (OPEN ISSUE 010)	in Response; M	displayed in the HTTP response and posted back for any decryption-related errors
to **	the party the transaction was sent to	Common Code Identifier format (OPEN ISSUE 001)	in Request; M	used in file transmittal and displayed in HTTP response and posted back for any decryption-related errors

Business Name	Definition	Format	Usage*	Condition
transaction-set	name of the document type being sent	8 character code; (OPEN ISSUE 003) ~~examples are:G873NMST, G873RQCF,etc. ;~~ refer to NAESB REQ~~WGQ~~ Implementation Guide, Related Standards Tab, Hypertext Transfer Protocol (HTTP) section, "HTTP transaction-set Code Values" table.	in Request; MA	used in file transmittal
trans-id	sequential number assigned to the transaction by the server ~~CGI/script~~ upon processing before being passed to the decryption process	integer up to ~~15~~ characters in length	in Response; M	displayed in the HTTP response and posted back for any decryption-related errors
version	the NAESB REQ~~WGQ~~ EDM version being used by the sender	numeric, decimal notation (e.g. 1.6~~4~~)	in Request; M	used in file transmittal and in posting error notifications

*The **Usage** column defines whether the element appears in the HTTP Request (Client-generated) or the HTTP Response (Server-generated), the order in which the element appears in the data stream, and whether the field is Mandatory (M) or Mutually-Agreed-To (MA).

** Common Code Identifier (OPEN ISSUE 001)

Batch Flow Diagram



Batch Flow Diagram

SENDING TRANSACTIONS

General Flow

The following is an example of the steps necessary to send an Internet ~~EDI/~~EDM file: ~~and batch FF/EDM file:~~

1. Open HTTP- connection (OPEN ISSUE 004)
2. Check connection status. If in error, re-queue file according to NAESB REQ~~WGQ~~ standards (this check should be performed here and throughout the following processes)
3. Post
   A. Authentication (password must be base64-encoded)
   B. Send multipart form
   C. Receive HTTP response data
4. Check connection status. If in error re-queue file according to NAESB ~~WGQ~~ REQ standards
5. Check HTTP status code (200 is good, less than 300 may be acceptable). If status is not successful re-queue file according to NAESB ~~WGQ~~ REQ standards
6. Close connection - wait for other end to close in a reasonable time
7. Parse HTTP response data elements
8. If request-status ok, then log success
9. If request-status error, then log error
10. If no valid request-status re-queue file according to NAESB REQ~~WGQ~~ standards
11. Remove file from sending queue when successful or when failed completely

If trading partners agree to implement signed receipts then the sending party must include the "receipt-security-selection" data element in the posted data. The receiving party must digitally sign the gisb-acknowledgement-receipt (OPEN ISSUE 002) and encapsulate the gisb-acknowledgement-receipt (OPEN ISSUE 002) and digital signature body parts within a MIME envelope with a Content-type of application/pgp-signature.

HTTP Post

Most people think of the Web as the process of using a browser to fetch, or download, documents, not upload them. Indeed, this capability is most prevalent. HTML pages, text files, and other documents can be retrieved by a browser using HTTP, FTP, or other protocols. However Web browsers allow the user to input data to a server using HTML forms. Data is entered into the fields of the form and is transmitted to the server by pressing a pushbutton or hitting the enter key.

The HTTP protocol has two methods for transmitting a request to a server. Both methods return a response to the client, which may be a document retrieved from the server. Both methods can be used to transmit form data. The GET method is the simplest and is used for requests that pass a small amount of information. Data passed with the GET method must be translated into a special format known as "URL encoding." Furthermore, the data stream transmitted by the GET method has a limit of 1024 characters. The POST method, on the other hand, allows the upload of complete datasets without special encoding. It is this method which will be used to send NAESB REQ~~WGQ~~ standard format transactions and receive the response from the server.

Using an Interactive Browser

When most of us think of Web surfing, we think of using an interactive browser. When you enter an HTTP Uniform Resource Locator (URL), the browser opens the HTML document identified by the URL. Basically, a URL is an "address" of an HTML document on a Web server. For purposes of NAESB ~~WGQ~~ REQ standards Uniform Resource Locator (URL) is as defined by the Internet Engineering Task Force (IETF).

In order to use an interactive browser to upload data, an HTML document must be created for that function. The HTML document can reside on either the server to which you are uploading or the client's system. The "form" feature of HTML allows that within an HTML document, a form can be created which allows the client to type in any necessary data elements, such as to, from, and input format and then specify a file to be uploaded from the PC. Some type of "Send" button would be on the form and when selected, the form would cause an HTTP POST to be issued, thereby uploading the file. Below is an example of an HTML document with a form which specifies the POST method and contains the required data elements.

An HTML form like that described here could be used with any retail browser that supports multipart POST with a file upload. When choosing a packaged browser, it is mandatory that it supports multipart encoding.

Sample of HTML document with a form to perform a multipart post using an interactive browser:

```
<HTML>
<HEAD>
<TITLE>NAESB REQ~~WGQ~~ File Upload</TITLE>
<H1><CENTER>NAESB ~~WGQ~~ REQ File Upload</CENTER></H1>
</HEAD>
<HR>
<BODY>
<form ENCTYPE="multipart/form-data" ACTION="http://www.target.server/cgi-bin/upload.exe"
METHOD=POST>
Enter Common Code Identifier for From and To (OPEN ISSUE 001)
From: <input TYPE="text" NAME="from" SIZE=20 VALUE=""><br>
To: <input TYPE="text" NAME="to" SIZE=20 VALUE=""><br>
NAESB ~~WGQ~~ REQ EDM Version: <input TYPE="text" NAME="version" SIZE=5 VALUE="1.64"><br>
Deliver Receipt To: <input TYPE="text" NAME="report-disposition-to" SIZE=20 VALUE=""><br>
Receipt Type: <input TYPE="text" NAME="receipt-report-type" SIZE=30
VALUE="gisb-acknowledgement-receipt"><br>(OPEN ISSUE 002)

IF requesting signed receipts also include:

Receipt Type: <input TYPE="text" NAME="receipt-security-selection" SIZE=30 VALUE="signed-receipt-
protocol=required, pgp-signature; signed-receipt-micalg=required, md5"><br>

Format of this file: <input TYPE="text" NAME="input-format" SIZE=6 VALUE="X12"><br>
Send this file: <INPUT NAME="input-data" TYPE="FILE"><br>
<input TYPE="submit" VALUE="Send File"><br>
</form>
</BODY>
</HTML>
```

The non-bolded text in this example is the basic HTML required for a document and allows your page to show a title in the title bar. The bolded text is the form within the document and is described in more detail.

The important characteristics of the form within the HTML document are:

ENCTYPE= specifies the encoding type. The “multipart/form-data” encoding type is identified as the standard encoding methodology.

- ACTION= specifies the URL that will receive the uploaded data. The Trading Partner Agreement(OPEN ISSUE 008) identifies the URLs for both parties.
- METHOD= specifies the HTTP protocol method. “POST” has been defined as the NAESB ~~WGQ~~ REQ standard method.
- <input ...> Five input areas are specified on this form: from, to, file format, file name, “Send File” button.

NOTE: This document often refers to “multipart POST” which implies the encoding type and method as described in this example.

When a user selects the “Send File” button, the browser will take the values entered in the input fields and reformat them according to the encoding type into a data stream. For the file identified for upload, the file is opened and its contents are included in the data stream, rather than the file’s name. The data stream is then sent to the URL specified by **ACTION=**. The URL will indicate an HTTP server script or program written to receive the data.

For a smaller site only performing a few transactions or file transfers this manual process would be viable as a primary transmission tool. This method could also be considered a back-up method to any batch or automated process that may be implemented. If the client provides its own form, the form can be copied for each trading partner. The only change to the HTML would be to modify the URL shown for the **ACTION=** attribute.

Using a Batch Browser

For companies that have automated much of their back-end process and prefer to avoid unnecessary human involvement, a so-called "batch browser" is needed. This browser needs to be capable of program-based or script-based initiation. At this time, there are few off-the-shelf batch browsers which use the POST method. Most packaged batch browsers use the GET method.

However, a batch browser can be created using custom programming. The batch browser will be coded to perform all of the same formatting that the interactive browser performed to send a data stream which conforms to the HTTP protocol. A batch browser must be coded as a sockets program. See Section “Writing a Batch Browser”.

A sockets program can be written with various programming languages which offer the required library to achieve this function.

Authentication

HTTP basic authentication includes a userid and password. Interactive browsers include a basic authentication feature which automatically prompts for userid and password. In a batch browser, the authentication must be specifically coded. The userid and password are to be base64-encoded within the document header. Base64-encoding utilities are readily available on the Internet as either public domain software or commercial libraries.

Server Response

The receiving server will send a gisb-acknowledgement-receipt (OPEN ISSUE 002) as an HTTP response to the client before dropping the client's connection. If the transacting parties agree to use signed receipts, then the receiving server applies a digital signature to the gisb-acknowledgement-receipt (OPEN ISSUE 002) and encapsulates the entire package in a MIME envelope of Content-type: application/pgp-signature. The response returned from the Web server will contain timestamps that include a timestamp recorded when the final byte from the file upload is received and stored. This timestamp is the official timestamp regarding transaction turnaround deadlines defined in NAESB ~~WGQ~~ REQ standards. This timestamp and all other pertinent file transmittal information should be logged when the posted file is stored on the receiving server as well as logged by the client. Likewise, any errors or warnings should be logged at both the server and client. (OPEN ISSUE 010)

Throughput Considerations

The performance of the batch browser is one component critical in meeting deadlines. It is conceivable that it may be called many times for a busy site ~~(such as a pipeline sending quick responses)~~. It should therefore utilize whatever performance techniques ~~that~~ are possible. For example, it may be desirable to write a multithreaded version which can handle a certain number of requests simultaneously with a single copy of the program.

HTTP Request Data Elements

The HTTP Request will provide all required data elements in the order defined. Any mutually agreed to data elements will follow the required data elements in the data stream.

Required Data Elements (listed in the required order)

Data Element Name	Description
from	Common Code Identifier of sending/client company. (OPEN ISSUES 001)
to	Common Code Identifier of receiving/server company. (OPEN ISSUES 001)
version	The NAESB ~~WGQ~~ REQ EDM version being used by the sender, in decimal notation (e.g. 1.64) The sending of the "version" data element is intended to assist in the early identification of EDM configuration errors and will not in itself dictate the version which a receiving party will support.
receipt-disposition-to	Common Code Identifier of the party to receive the acknowledgement receipt. (OPEN ISSUE 001)
receipt-report-type	Type of receipt requested "gisb-acknowledgement-receipt". (OPEN ISSUE 002)
input-format	Descriptor of the data format within the input data set.
input-data	The properly formatted file of electronic commerce data.

Mutually Agreed Upon Data Elements

Data Element Name	Description

transaction-set	Descriptor of the transaction types included in the input-data. The values used must be from the unique 8-character names defined in the Implementation Standards. See the HTTP transaction-set Code Values table in the Hypertext Transport Protocol (HTTP) section Related Standards Tab for the various transaction types and their corresponding 8-character names. (OPEN ISSUE 003)
receipt-security-selection	Used to request signed receipts from the party receiving a file upload.

Writing a Batch Browser

A batch browser needs to simulate the actions of an interactive browser. As stated earlier, the interactive browser will take the HTML form and reformat the information according to the HTTP protocol before it sends the data stream to the HTTP server. The reformatting involves adding a header and placing field delimiters around the data items. A batch browser needs to produce the same kind of data stream and therefore, writing a batch browser requires some specific knowledge of the HTTP protocol. ~~See the NAESB WGQ home page for sources of HTTP protocol information.~~

First, consider the header:

~~Sample~~ Example of a typical header sent to the HTTP server

```
POST /cgi-bin/AS2dispatcher HTTP/1.1
Referer: http://www.get.a.life/upl.htm
Connection: Keep-Alive
User-Agent: brow v0.1 XYZ Corp.
Host: localhost
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, */*
Content-type: multipart/form-data; boundary=---------------------------87453838942833
Content-Length: 5379
```

This information is documentary in purpose. The parts that are important are:

The first line: *POST /cgi-bin/AS2dispatcher HTTP/1.1* indicating that the POST method is used and which program to call.

In the example above t~~T~~he content type line is:

Content-type: multipart/form-data; boundary=---------------------------87453838942833

The content-type element indicates that the encoding method is multipart. It also identifies the character string used as the boundary. The boundary will appear between each field as a delimiter. **In this example**, the boundary is comprised of 27 hyphen characters followed by a number.

The boundary can be any character string that you choose except that it is required that it will not ~~to~~ occur anywhere else in the form or in the transaction being sent. This is usually accomplished by using either the system clock or a random number so that even if by some remote chance the string appears in the document it would not appear in any re-transmission of the file. It is strongly recommended that a relatively long string be used as a boundary. The boundary when used as a separator requires two hyphen characters appended to the front of

the string as you can note by the lines between the data fields in the example. The last boundary required in the form is two hyphen characters appended to the back of the separator boundary, this is used to indicate to the server program that this is the end of the data.

In the example above, tThe content length is:

Content-Length: 5379

The content-length value should match the number of bytes contained in the entity body including the characters in the boundary lines, variable content, blank lines, etc. In essence, it tells the server how much is going to come after this point.

In this example, the data portion, or body, sent to the server program is as follows and assumes only required data elements are sent (not mutually agreed data elements):

```
----------------------------87453838942833
Content-Disposition: form-data; name="from"

123456789 (OPEN ISSUE 001)
----------------------------87453838942833
Content-Disposition: form-data; name="to"

234567890 (OPEN ISSUE 001)
----------------------------87453838942833
Content-Disposition: form-data; name="version"

1.64
----------------------------87453838942833
Content-Disposition: form-data; name="receipt-disposition-to"

123456789 (OPEN ISSUE 001)
----------------------------87453838942833
Content-Disposition: form-data; name="receipt-report-type"

gisb-acknowledgement-receipt (OPEN ISSUE 002)
----------------------------87453838942833
Content-Disposition: form-data; name="input-format"

x12
----------------------------87453838942833
Content-Disposition: form-data; name="input-data"; filename="c:\temp\smallnom.bin"
Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"

--8760
Content-Type: application/pgp-encrypted

Version: 1

--8760
Content-Type: application/octet-stream

-----BEGIN PGP MESSAGE-----
Version: PGP 6.5

hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiwYsHsz0e8
sb7ErC340MrNA/dw3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAMLWwODGlQxhSuc
z8rMSgQ5mZzcOJwBdWLW70efgsu/9UljuJjYc1uZ6C03eFQv/43fkB+alATtgydxX4g8QK6
64ad+Jo/XUICSmWBL66fqJR1KLeLf4wTaqGy174Aq48Wpwvg1Eh785zC03UAw0qg0ug
Mt86dPeyd91e2JiqqwDYEf/DYEKD0J9BGiGpS/uAupNKj8Ocp2IWClxKOGUbxpVNOnNT
qWHS/GntegvDE/7/ewCxDxsnmQS95pOl141QZ1RqbeNaqx2Dq/ra9g65HNchOCzjul5Vi8
HHf6Yhg2WnROe+npByyCue6rihqgNVOJwj0Cvzpb4JE+gMDf3q4ISUb1Fv7/+SSFHDdnh
dC5YTpqf1Bc3B07hiLmtTXqNit31EbX9UVElObzSa9ZhxbC6/eSl7Nuf5ZTDsh9nrk+QQJ6
FeC9W4cqXLj7IZySaRO8Vtff+4ktqeuhYusT4kSpnk027aw4O/5jomUkfb22CAe4=
=Oiuo
-----END PGP MESSAGE-----
--8760--
----------------------------87453838942833--
```

The important characteristics of the above stream are:

- The boundary string appears at the beginning of each data field in the body.
- For each body data field, two identifiers define the contents of the data field. The Content-disposition identifier defines that “form-data” is contained in the element. The name identifier defines the name of the data element. These data element names must

match the name specified by NAESB REQ~~WGQ~~. The name identifier is not completely relevant since the fields should be present in the correct order but this field should be checked to verify the validity of the form content.

- The actual data value of the field is always preceded by a line termination. This is typically used as a marker for the server program to indicate that a data value will follow. For example, note the blank line preceding "X12" in the above exs~~s~~ample. In most programming libraries and commercial products the starting delimiter is "\r\n\r\n" (C~~c~~ notation).

- The data field containing the NAESB ~~WGQ~~ REQ standard file has two extra identifiers: first the name of the file sent from the source computer, filename="c:\temp\smallnom.bin", and second a content type identifier on a separate line. This line should always be constructed to reflect the content-type of the data being transmitted, in accordance with accepted Internet standards. If the data file contains clear text, X12 data, as shown in the above example, the content-type identifier follows the recommendations of RFC 1767, "MIME Encapsulation of EDI Data", and the "Content-Type:application/EDI-X12" is used. However, for security purposes it is recommended that all data be encrypted and digitally signed prior to transmission over the Internet. There are IETF standards for describing and packaging encrypted data files, most notably, "MIME Security with Pretty Good Privacy (PGP)", RFC 2015 and "MIME-based Secure EDI", RFC TBD (OPEN ISSUE 005).

- After the contents of the last data field, the boundary appears again as the last item of the form with the required two hyphen characters following the boundary at the end of the form to indicate the end of the data.

When the sender of a file intends to use encryption and digital signature functions to secure the contents of a data file the file must be prepared in accordance with the above mentioned IETF standards. ASC X12 data must first be prepared in canonical form as specified in RFC 1767. The ASC X12 data file would be concatenated with the MIME Content-type of application/EDI-X12 as the first line of the file.

For example below is a file before encryption:

```
Content-type: application/EDI-X12

ISA~00~ ~01~AAA6300300~14~1234567890000 ~14~2345678900000
... more data from the X12 file…
IEA~1~000003616
```

This file is encrypted, signed and packaged, which follows EDIINT AS1 and RFC 2015, which produces a file containing MIME headers and encrypted content as follows.

Below is the file after encryption:

```
Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"

--8760
Content-Type: application/pgp-encrypted

Version: 1

--8760
Content-Type: application/octet-stream

-----BEGIN PGP MESSAGE-----
Version: PGP 6.5
hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiwYsHsz0e8sb7Er34
0MrNA/dw3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAMLWwODGlQxhSucz8rMSgQ5mZzcOJ
wBdWLW70efgsu/9UljuJjYc1uZ6C03eFQv/43fkB+alATtgydxX4g8QK664ad+Jo/XUICSmWBL66fqJ
R1KLeLf4wTaqGy174Aq48Wpwvg1Eh785zC03UAw0qg0ugMt86dPeyd91e2JigqwDYEf/DYEKD0J
9BGiGpS/uAupNKj8Ocp2IWClxKOGUbxpVNOnNTqWHS/GntegvDE/7/ewCxDxsnmQS95pOl141Q
Z1RQbeNaqx2Dq/ra9g65HNchOCzjul5Vi8HHf6Yhg2WnROe+npByyCue6rihqgNVOJwj0cVzpb4JE
+gMDf3q4ISUb1Fv7/+SSFHDdnhdC5YTpqf1Bc3B07hiLmtTXqNit31EbX9.UVElObzSa9ZhxbC6/eS
l7Nuf5ZTDsh9nrk+QQJ6FeC9W4cqXLj7IZySaRO8Vtff+4ktqeuhYusT4kSpnk027aw4O/5jomUkfb22
CAe4=
=Oiuo
-----END PGP MESSAGE-----

--8760--
```

~~Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"~~

~~--8760~~
~~Content-Type: application/pgp-encrypted~~

~~Version: 1~~

~~--8760~~
~~Content-Type: application/octet-stream~~

~~-----BEGIN PGP MESSAGE-----~~
~~Version: PGP 6.5~~

~~hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiw~~
~~YsHsz0e8sb7Er340MrNA/dw3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAML~~
~~WwODGlQxhSucz8rMSgQ5mZzcOJwBdWLW70efgsu/9UljuJjYc1uZ6C03eFQv/~~
~~43fkB+alATtgydxX4g8QK664ad+Jo/XUICSmWBL66fqJR1KLeLf4wTaqGy174Aq~~
~~48Wpwvg1Eh785zC03UAw0qg0ugMt86dPeyd91e2JigqwDYEf/DYEKD0J9BGiG~~
~~pS/uAupNKj8Ocp2IWClxKOGUbxpVNOnNTqWHS/GntegvDE/7/ewCxDxsnmQS~~
~~95pOl141QZ1RQbeNaqx2Dq/ra9g65HNchOCzjul5Vi8HHf6Yhg2WnROe+npByy~~
~~Cue6rihqgNVOJwj0cVzpb4JE+gMDf3q4ISUb1Fv7/+SSFHDdnhdC5YTpqf1Bc3B~~
~~07hiLmtTXqNit31EbX9.UVElObzSa9ZhxbC6/eSl7Nuf5ZTDsh9nrk+QQJ6FeC9W~~
~~4cqXLj7IZySaRO8Vtff+4ktqeuhYusT4kSpnk027aw4O/5jomUkfb22CAe4=~~
~~=Oiuo~~
~~-----END PGP MESSAGE-----~~

~~--8760--~~

This file is associated with the “input-data” data element of the multipart-form-data and is sent to the recipient using the HTTP POST method.

The HTTP POST data stream used to send this file would appear as follows:

```
-----------------------------87453838942833
Content-Disposition: form-data; name="from"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="to"

234567890 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="version"

1.46
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-disposition-to"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-report-type"

gisb-acknowledgement-receipt (OPEN ISSUE 002)
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-security-selection"

signed-receipt-protocol=required, pgp-signature; signed-receipt-micalg=required, md5
-----------------------------87453838942833
Content-Disposition: form-data; name="input-format"

X12
-----------------------------87453838942833
Content-Disposition: form-data; name="input-data"; filename=”c:\temp\smallnom.bin”
Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"

--8760
Content-Type: application/pgp-encrypted

Version: 1

--8760
Content-Type: application/octet-stream

-----BEGIN PGP MESSAGE-----
Version: PGP 6.5

hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiwY
sHsz0e8sb7ErC340MrNA/dw3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAML
```

```
WwODGlQxhSucz8rMSgQ5mZzcOJwBdWLW70efgsu/9UljuJjYc1uZ6C03eFQv/4
3fkB+alATtgydxX4g8QK664ad+Jo/XUICSmWBL66fqJR1KLeLf4wTaqGy174Aq48
Wpwvg1Eh785zC03UAw0qg0ugMt86dPeyd91e2JigqwDYEf/DYEKD0J9BGiGpS/
uAupNKj8Ocp2IWClxKOGUbxpVNOnNTqWHS/GntegvDE/7/ewCxDxsnmQS95p
Ol141QZ1RQbeNaqx2Dq/ra9g65HNchOCzjul5Vi8HHf6Yhg2WnROe+npByyCue6
rihqgNVOJwj0cVzpb4JE+gMDf3q4ISUb1Fv7/+SSFHDdnhdC5YTpqf1Bc3B07hiL
mtTXqNit31EbX9UVElObzSa9ZhxbC6/eSl7Nuf5ZTDsh9nrk+QQJ6FeC9W4cqXLj
7IZySaRO8Vtff+4ktqeuhYusT4kSpnk027aw4O/5jomUkfb22CAe4=
=Oiuo
-----END PGP MESSAGE-----

--8760--

----------------------------87453838942833--
```

Although the specifications for multipart POST include several variations on this method, the NAESB ~~WGQ~~ REQ standards do not include implementing them at this time (OPEN ISSUE 006). The most significant of these variations is to send several files in a single post. Additionally, sending a single file split into more than one post is not expected by the HTTP server.

The output from the browser is important to the understanding of the processing needed by the server script or program which must interpret the result. The complete data stream from the browser will look like:

```
POST /cgi-bin/AS2dispatcher HTTP/1.1
Referer: http://www.get.a.life/upl.htm
Connection: Keep-Alive
User-Agent: brow v0.1 XYZ Corp.
Host: localhost
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, */*
Content-type: multipart/form-data; boundary=---------------------------87453838942833
Content-Length: 5379

-----------------------------87453838942833
Content-Disposition: form-data; name="from"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="to"

234567890 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="version"

1.46
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-disposition-to"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-report-type"

gisb-acknowledgement-receipt (OPEN ISSUE 002)
-----------------------------87453838942833
Content-Disposition: form-data; name="input-format"

X12
-----------------------------87453838942833
Content-Disposition: form-data; name="input-data"; filename="c:\temp\smallnom.bin"
Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"

--8760
Content-Type: application/pgp-encrypted

Version: 1

--8760
Content-Type: application/octet-stream
```

```
-----BEGIN PGP MESSAGE-----
Version: PGP 6.5

hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiwYsHsz0e8sb7ErC3
40MrNA/dw3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAMLWwODGlQxhSucz8rMSgQ5mZzcO
JwBdWLW70efgsu/9UljuJjYc1uZ6C03eFQv/43fkB+alATtgydxX4g8QK664ad+Jo/XUICSmWBL66fqJ
R1KLeLf4wTaqGy174Aq48Wpwvg1Eh785zC03UAw0qg0ugMt86dPeyd91e2JigqwDYEf/DYEKD0J9
BGiGpS/uAupNKj8Ocp2IWClxKOGUbxpVNOnNTqWHS/GntegvDE/7/ewCxDxsnmQS95pOl141QZ
1RqbeNaqx2Dq/ra9g65HNchOCzjul5Vi8HHf6Yhg2WnROe+npByyCue6rihqgNVOJwj0cVzpb4JE+g
MDf3q4ISUb1Fv7/+SSFHDdnhdC5YTpqf1Bc3B07hiLmtTXqNit31EbX9UVElObzSa9ZhxbC6/eSl7N
uf5ZTDsh9nrk+QQJ6FeC9W4cqXLj7IZySaRO8Vtff+4ktqeuhYusT4kSpnk027aw4O/5jomUkfb22CA
e4=
=Oiuo
-----END PGP MESSAGE-----
--8760--
----------87453838942833--
```

Client Specifications

Each client should be synchronized to a clock in the network of atomic clocks that is accessible via the Internet. ~~Central Time (Central Standard / Central Daylight) available at any of the sites on a synchronized network of atomic clocks.~~ Each trading party should observe the client clock over a period of time to determine the amount of "drift" occurring throughout the day with respect to the atomic clock. The client should be synchronized as many times per day as necessary to ensure synchronization. ~~The most important time period to ensure synchronization is just prior to the nomination deadline.~~ Please refer to Appendix A, "Time Synchronization" for references on public sites for synchronization.

~~The HTTP Request will provide all required data elements in the order defined. Any mutually agreed to data elements will follow the required data elements in the data stream.~~

RECEIVING TRANSACTIONS

General Flow

The following is an example of the steps necessary to receive an Internet ~~EDI/~~EDM file: ~~and batch FF/EDM file:~~

1. Parse multi-part form
2. Validate HTTP request data elements
3. If HTTP request data elements in error, return appropriate standard error code in the HTTP response data elements
4. Save data
5. Create gisb acknowledgement receipt (OPEN ISSUE 002)

5.1 If using signed receipts:

5.1.1 Produce a digital signature over the gisb acknowledgement receipt (OPEN ISSUE 002) created in step 5.

5.1.2 Encapsulate the gisb acknowledgement receipt (OPEN ISSUE 002) and Digital Signature body parts in a content-type of ~~application/~~multipart/signed envelope

6. Return HTTP response, the gisb acknowledgement receipt (OPEN ISSUE 002) object, back to server

7. Close connection
8. Log final results
9. Route data file to the next process based upon input format

Using a Web Server

As was stated above, the protocol HTTP using the POST method as the means to upload a transaction is the standard. (OPEN ISSUE 004). On the receiving side of this HTTP request is the Web server, the second primary component in Web technology. However, the Web server does not actually save the uploaded file. Instead, it hands this responsibility over to a special program which, in effect, extends the Web server's functionality with custom programming. ~~This special program is known as a Common Gateway Interface (CGI) program.~~ Besides storing the file, ~~the CGI~~this program has the task of parsing the incoming HTTP message, noting the date, time and time zone indicator so to create the timestamp, and creating an HTML response to the sender~~ing browser~~. (OPEN ISSUE 010)

An EDM receiving program may be implemented using a variety of technologies and techniques. Some options include, Active Server Pages (ASP), Common Gateway Interface (CGI), Java Server Pages (JSP), Java Servlet technology and other technologies.

The NAESB ~~WGQ~~ REQ standard places no particular requirements on the vendor for the Web server. Most commercially available Web servers will provide the needed functionality. However, please refer to comments regarding performance under "Throughput Considerations" later in this section. ~~While the current approach to security does not require a Secure Sockets Layer (SSL) or Secure Hyper Text Transfer Protocol (S-HTTP) capable server, one of these may be a requirement in the future.~~ Determine whether the product you are considering provides a secure version capable of ~~either~~ SSL. ~~or S-HTTP. (Unfortunately, it is too early to predict which of these, if either, will prevail as an emerging standard.)~~

~~Another capability you may wish to consider when choosing a Web server is whether it supports Binary Gateway Interface (BGI) capability. Specifically, this is the capability to run Dynamic Link Library (DLL) equivalents of CGI applications. Some vendors call this capability Internet Server Application Programming Interface (ISAPI) while others call it Netscape Application Programming Interface (NSAPI).~~

The ~~CGI~~ Receive Process

A ~~CGI (or BGI)~~receiving program must be able to parse the multipart form. It accomplishes this by finding the boundary string in the Content-Type header and scanning for its occurrences further within the uploaded stream. Upon finding these boundary strings, the program must next determine the content-disposition for each data element. This allows detection of the required text elements as well as the NAESB ~~WGQ~~ REQ standard format file.

The ~~CGI~~ receiving program is not concerned with the content of the NAESB ~~WGQ~~ REQ standard format data. In fact, the standard format file will be encrypted (see the Security section). The ~~CGI~~ program will merely accept the standard format data and store it as a file. ~~The CGI~~It will use the Content-Length to determine how much data to expect in the body.

Throughput Considerations

It is critical that the Web server and the associated ~~CGI~~ receiving programs perform efficiently.

This is particularly true for ~~pipelines~~ high volume sites~~which may expect to see a large number of nomination transactions come in close to the deadline~~ processing time sensitive materials. For the greatest possible throughput, the Web server should be multithreaded. The ~~CGI~~ receiving program should be multithreaded as well or be as small and efficient as ~~is~~ possible ~~with a C program~~. ~~BGI programming may provide even better performance.~~ It is also suggested that a Web server and operating system be chosen that allow for scaling to a more powerful computer (possibly multi-CPU). Transaction volumes are likely to be light at first but may become heavy rather quickly.

~~Writing the CGI~~Developing the Receive Process

A ~~CGI~~ receive process ~~is~~ requires ~~the~~ an executable program or module that is called by the HTTP server when it is identified by a POST ~~or GET~~ operation. ~~(In this case we are only concerned with POST method operations.)~~

When the HTTP server receives a POST it will first read the header and populate environment variables before calling the ~~CGI~~receiving program. A sample header is shown below.

```
POST /cgi-bin/AS2dispatcher HTTP/1.1
Referer: http://www.get.a.life/upl.htm
Connection: Keep-Alive
User-Agent: brow v0.1 XYZ Corp.
Host: localhost
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, */*
Content-type: multipart/form-data; boundary=---------------------------87453838942833
Content-Length: 5379
```

The important point to note is that you will not specifically code the step of reading the header and populating the environment variables, the HTTP server performs it for you. The variables populated are usually listed with the HTTP server documentation.

After reading this header the server will buffer the remaining data transmitted and then call the ~~CGI~~ receiving program ~~process~~ specified in the POST statement. Do not assume that the ~~CGI process~~receiving program is called as soon as the header is read. The more common implementations will buffer the entire transmission before calling the program~~CGI~~. You may want to check your server implementation if this characteristic is important to you.

The ~~called CGI process~~receiving program will have the following input stream available ~~in the standard input (stdin)~~ , and will have most of the header data available in environment variables.

```
-----------------------------87453838942833
Content-Disposition: form-data; name="from"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="to"

234567890 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="version"

1.64
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-disposition-to"

123456789 (OPEN ISSUE 001)
```

```
-----------------------------87453838942833
Content-Disposition: form-data; name="receipt-report-type"

gisb-acknowledgement-receipt (OPEN ISSUE 002)
-----------------------------87453838942833
Content-Disposition: form-data; name="input-format"

X12
-----------------------------87453838942833
Content-Disposition: form-data; name="input-data"; filename="c:\temp\smallnom.bin"
Content-Type: multipart/encrypted; boundary=8760; protocol="application/pgp-encrypted"

--8760
Content-Type: application/pgp-encrypted

Version: 1

--8760
Content-Type: application/octet-stream

-----BEGIN PGP MESSAGE-----
Version: PGP 6.5

hQCMAzRG1pEOIOvdAQP+JMr0m/9+8yOL60Z9Vr6fFV81FCExB/o0xmwiMkiwYsHsz0e8sb7ErC340MrNA/d
w3taGMjmI+CXYRF/PLEdg1NZE1ZCtNeL4YdIHAMLWwODGlQxhSucz8rMSgQ5mZzcOJwBdWLW70efgsu/
9UljuJjYc1uZ6C03eFQv/43fkB+alATtgydxX4g8QK664ad+Jo/XUICSmWBL66fqJR1KLeLf4wTaqGy174Aq48
Wpwvg1Eh785zC03UAw0qg0ugMt86dPeyd91e2JigqwDYEf/DYEKD0J9BGiGpS/uAupNKj8Ocp2IWClxKOG
UbxpVNOnNTqWHS/GntegvDE/7/ewCxDxsnmQS95pOI141QZ1RQbeN.aqx2Dq/ra9g65HNchOCzjuI5Vi8HHf
6Yhg2WnROe+npByyCue6rihqgNVOJwj0cVzpb4JE+gMDf3q4ISUb1Fv7/+SSFHDdnhdC5YTpqf1Bc3B07hiL
mtTXqNit31EbX9UVElObzSa9ZhxbC6/eSl7Nuf5ZTDsh9nrk+QQJ6FeC9W4cqXLj7IZySaRO8Vtff+4ktqeuhYu
sT4kSpnk027aw4O/5jomUkfb22CAe4=
=Oiuo
-----END PGP MESSAGE-----
--8760--
-----------------------------87453838942833-- —
```

This process should check for basic validity in the environment variables and the data stream. It will parse the variables/data from the format. The data validations should include:

- The “REQUEST_METHOD” environment variable is “POST”.
- The “CONTENT_TYPE” environment variable should be “multipart/form-data” and a boundary, which is unique in that it cannot appear anywhere in the transaction being sent (see above stream for an example).

The input stream should ~~be~~ support ~~in~~ binary mode to accommodate encrypted files.

- Each data element ~~is~~ should be preceded by the boundary with the required two hyphen characters appearing before it.
- Each data element should contain the correct name on the *Content-Disposition* line.
- Each data element should have \r\n\r\n (C~~c~~ notation) before the start of the data.
- In the receiving program, all tag values in the HTTP header should be evaluated in a case insensitive manner.

Finding the end of the stream using both content length and the boundary end mark (the boundary with two required hyphen characters in front and behind) is usually the best method to detect improperly formatted input.

Immediately after the ~~CGI~~ receiving program validates (as above), parses, and saves the data, ~~the CGI~~it should record the time and construct a gisb acknowledgement receipt (OPEN ISSUE 002) described in the following section. This ~~gisb acknowledgement~~ receipt is ~~usually~~ sent from the ~~CGI~~ receiving program ~~by writing to the standard output (stdout) of the CGI process~~to the sending program. If using signed receipts, the receiving party must produce a digital signature of the gisb acknowledgement receipt (OPEN ISSUE 002)and send both the gisb acknowledgement receipt (OPEN ISSUE 002) and digital signature body parts within a multipart/signed MIME envelope.

Receive Process URL~~/CGI~~ Implementation Guidelines

NAESB ~~WGQ~~ REQ standard 4.3.12 (OPEN ISSUE 007) states

> *"As a minimum, with a trading partner agreement, one designated site for receipt should be identified for each trading partner. That site should be identified by a specific Uniform Resource Locator (URL). This does not preclude multiple designated sites being mutually agreed to between trading partners." (OPEN ISSUE 008)*

~~This standard specifies that e~~Each company must offer at least one URL ~~(URL is a one-to-one association with CGI)~~ to accept ~~EDI/EDM and FF/EDM~~ files using Internet EDM. However, a maximum number of URLs per company is *not* included so that companies that wish to offer additional URLs will not be held back from doing so. Though companies are free to construct a~~n EDI/EDM and FF/EDM~~ Web site with multiple "single-purpose" URLs, NAESB ~~WGQ~~ REQ recommends the use of one "general-purpose" URL.

Error notifications include errors that occur some time after the gisb acknowledgement receipt (OPEN ISSUE 002) is sent (such as a file decryption error) as well as errors on the transactions. A general-purpose URL would handle all error notifications.

Companies that wish to offer multiple URLs must negotiate additional URLs with their trading partners. All URLs that will be required for use in the ~~EDI/EDM and FF/EDM~~Internet EDM process must be agreed to and defined in the Trading Partner Agreement (TPA) (OPEN ISSUE 008) signed by both companies. ~~An~~ For example, a separate URL may be used for customized processing, such as high or low priority transactions. ~~of a company that would define multiple URLs in the TPA is a company that comes to agreement with its partners that all nominations-related transactions are sent to a URL offered by an out-sourcing vendor. All other transactions are sent to a URL offered on its own Web server.~~

~~A company can also offer additional URLs which have a special purpose without defining the URL in a TPA. Such additional URLs would be a way of offering additional customer service. The trading partners would have the option of using the additional URL. An example of a company that offers a URL for additional customer service is a company that offers a URL to accept capacity release information requests with immediate turnaround while the general-purpose URL is set up to postpone all capacity release information requests until 4 p.m. that day. This company wishes to keep its primary Web server available for nominations requests while other information requests are handled on a secondary Web server.~~

To those companies who wish to offer multiple URLs, NAESB ~~WGQ~~ REQ strongly recommends that you divide URL usage along transactional grouping lines., ~~such as nominations or capacity release.~~ Create groupings that are likely to correlate to business functions in a company. ~~within the gas industry.~~ Do not divide URL usage along an arbitrary internally-understood group such as region of the country. Remember that the intent of not specifying a maximum number of

URLs is to allow companies the freedom to offer services, not to further complicate the ~~EDI/EDM and FF/~~ Internet EDM process.

~~Some companies have raised a question of offering a "default" URL. The default URL would be used when the trading partner was not able to determine the proper URL from the trading partner agreement. NAESB WGQ does not recommend that any company offer a default URL. When situations arise where the TPA does not fully define the appropriate URL, the partners should communicate the situation, agree to the appropriate URL usage, and revise the TPA.~~

Server Specifications

The HTTP server should be synchronized to ~~Central Time (Central Standard / Central Daylight)~~a clock in the network of atomic clocks that is accessible by the Internet. ~~available at any of the sites on a synchronized network of atomic clocks.~~ Each trading party should observe the ~~server~~ clock over a period of time to determine the amount of "drift" occurring throughout the day. The server should be synchronized as many times per day as necessary to ensure synchronization. ~~The most important time period to ensure synchronization is just prior to the nomination deadline.~~ Please refer to Appendix A, "Time Synchronization" for references on public sites for synchronization.

The HTTP server will provide an HTTP response to the client according to NAESB ~~WGQ~~ REQ standards.

All data element names of the HTTP request and response fields will be in lower case. Note that the NAESB ~~WGQ~~ REQ standard format file contained in the request and response may follow a different standard.

Carriage returns and line feeds will be ignored in all files.

A field delimiter of "*" will be used in the HTTP response. Please refrain from displaying a "*" anywhere else in the response so as not to confuse programs that need to parse on this basis.

No spaces should surround the equal sign or the field delimiter.

The required data elements must appear first in the response.

Additional information can be included after the required elements at the server's discretion.

The gisb acknowledgement receipt (OPEN ISSUE 002) must be enveloped in a multipart/report, as specified in EDIINT AS2 (OPEN ISSUE 005) following the rules for Generalized Receipts. If signed receipts are used, the gisb acknowledgement receipt (OPEN ISSUE 002) (including the multipart/report envelope) is digitally signed, producing a application/pgp-encrypted body part. Both the multipart/report (gisb acknowledgement receipt(OPEN ISSUE 002)) and the application/pgp-signature body parts are placed in a multipart/signed envelope and the entire package is returned to the sender.

The first occurrence of the field name within the response will contain the value.

If an HTML response is given, all data must be presented in a user-readable fashion. For example, if the required machine-readable fields are embedded in comments, another representation of these fields must be presented to the user.

Servers should be configured to use one of the allowable TCP ports listed in Appendix E(OPEN ISSUE 009).

HTTP Response Data Elements

Required Data Elements (listed in the required order)

Data Element Name	Description
time-c	the time of transfer completion at the server. The format will be *yyyymmddhhmmss-ZZ*. The –ZZ indicates the difference, in hours, between local time and Coordinated Universal Time (UTC). For example, 20030107142004-06, reflects a timestamp that was issued by a machine set to the Central time zone. In cases where a machine is within a time zone that is ahead of UTC the (-) would change to a (+). (OPEN ISSUE 010)
request-status	a text status indicator by the server. The only defined value at this time is “ok” for a successful transfer. The server should supply a descriptive indication of the error detected following the standards for error codes and messages presented in Table A, “Internet EDM Standard Error Codes and Messages”.
server-id	a *domainname* or *hostname.domainname* uniquely identifying the server associated with the ~~CGI~~program that received and processed the file.
trans-id	a number (integer) up to 15 characters in length uniquely identifying the received transaction file at the server. The trans-id will uniquely identify the file only at the receiving server. A client may receive non-unique trans-ids across multiple servers.

~~Samples~~ Examples of HTTP Response Required Data Elements:

successful, ~~plain text~~multipart format:

```
Content-Type: multipart/report; report-type="gisb-acknowledgement-receipt"; boundary="GISB7867" (OPEN ISSUE 002)

--GISB7867
Content-type: text/html

<HTML><HEAD><TITLE>Acknowledgement Receipt Success</TITLE></HEAD> <BODY><P>
time-c=19960619082855* (OPEN ISSUE 010)
request-status=ok*
server-id=coolhost*
trans-id=234423897*
</P> </BODY></HTML>
--GISB7867
Content-type: text/plain

time-c=19960619082855* (OPEN ISSUE 010)
request-status=ok*
server-id=coolhost*
trans-id=234423897*
--GISB7867--
```

or

error, ~~plain text~~multipart format:

```
Content-Type: multipart/report; report-type="gisb-acknowledgement-receipt"; boundary="GISB7866" (OPEN ISSUE 002)

--GISB7866
Content-type: text/html
```

```
<HTML><HEAD><TITLE>Acknowledgement Receipt Error</TITLE></HEAD> <BODY><P>
time-c=19960619082855* (OPEN ISSUE 010)
request-status=EEDM106: Invalid To Common Code Identifier*
server-id=coolhost*
trans-id=234423897*
</P> </BODY></HTML>
--GISB7866
Content-type: text/plain

time-c=19960619082855* (OPEN ISSUE 010)
request-status=EEDM106: Invalid To Common Code Identifier*
server-id=coolhost*
trans-id=234423897*
--GISB7866--
```

or

warning, ~~plain text~~multipart format:

```
Content-Type: multipart/report; report-type="gisb-acknowledgement-receipt"; boundary="GISB7866" (OPEN ISSUE 002)


--GISB7866
Content-type: text/html

<HTML><HEAD><TITLE>Acknowledgement Receipt Warning</TITLE></HEAD> <BODY><P>
time-c=19960619082855* (OPEN ISSUE 010)
request-status=WEDM100: Transaction Set Sent, Not Mutually Agreed*
server-id=coolhost*
trans-id=234423897*
</P> </BODY></HTML>
--GISB7866
Content-type: text/plain

time-c=19960619082855* (OPEN ISSUE 010)
request-status= WEDM100: Transaction Set Sent, Not Mutually Agreed *
server-id=coolhost*
trans-id=234423897*
--GISB7866--
```

or, as a more elaborate response to a successful transmittal,

```
Signed Receipt
Content-Type:multipart/signed; micalg=pgp-md5; protocol="application/pgp-signature";
boundary=8760

--8760

Content-Type: multipart/report; report-type="gisb-acknowledgement-receipt"; boundary="GISBB7867"
(OPEN ISSUE 002)

--GISB7867
Content-type: text/html

<HTML><HEAD><TITLE>Acknowledgement Receipt Success</TITLE></HEAD> <BODY><P>

time-c=19960619082855* (OPEN ISSUE 010)
request-status=ok*
server-id=coolhost*
```

trans-id=234423897*

</P> </BODY></HTML>

--GISB7867
Content-type: text/plain.
time-c=19960619082855* (OPEN ISSUE 010)
request-status=ok*
server-id=coolhost*
trans-id=234423897*
--GISB7867--
--8760
Content-Type: application/pgp-signature

-----BEGIN PGP MESSAGE-----

Version: ~~2.6.2~~6.5

iQCVAwUBMJrRF2N9oWBghPDJAQE9UQQAtl7LuRVndBjrk4EqYBIb3h5QXIX/LC//JV5bNvkZIGPIcEmI5iF
d9boEgvpirHtIREEqLQRkYNoBActFBZmh9GC3C041WGquMbrbxc+nIs1TIKlA08rVi9ig/2Yh7LFrK5Ein57U/
W72vgSxLhe/zhdfolT9BrnHOxEa44b+EI=
=ndaj

-----END PGP MESSAGE-----

--8760—

HTML format (this example is for a successful transmittal):

HTML format (this example is for a successful transmittal): <html> <head> <title> Upload OK</ title></ head> <!-- time- c= 19960123203618*-->_ <!-- request- status= ok* --> <!-- server- id= coolhost*--> <!-- trans- id= 232323897*--> <h1> Upload OK </ h1>< br> <body> <B> File Saved at (time- c): </B> 19960123203618< br> <B> Status (request- status): </ B> ok< br> <B> Server (server- id): </ B>coolhost< br> <B> Transaction ID (trans- id): </ B> 232323897< br> </ body> </ html> (OPEN ISSUE 010)

Using a Service Provider for Web Hosting

If you do not wish to install and maintain a Web server, you may wish to contact an Internet Service Provider (ISP) to provide the hosting service for you. Consider the following when selecting an ISP for Web hosting:

- limit on storage space for receiving files
- ability to meet NAESB ~~WGQ~~ REQ standards for HTTP response
- accommodation for ~~CGI~~ receiving program to meet NAESB ~~WGQ~~ REQ standards for validation and processing.

SECURITY

Security Concepts

The security requirements include the current four primary security aspects: data privacy, data integrity, authentication, and non-repudiation.

- Data privacy: unauthorized parties cannot decipher the content of the data.
- Data integrity: unauthorized parties cannot modify or corrupt the data.
- Authentication: the receiver is certain of the identity of the sender.
- Non-repudiation: the sender cannot deny ownership of the transaction if it was sent with his/her digital signature.

In general, these needs are met by using the Basic Authentication capability of the Web server and the encryption and digital signature capability of the PGP and OpenPGP security application for securing transactions.

Understanding PGP or OpenPGP

Pretty Good Privacy (PGP) is the name of the chosen security application. OpenPGP is the Internet Engineering Task Force standard version of PGP which excludes all patented algorithms, allowing free commercial use of the standard. See the NAESB ~~WGQ home page~~Web site for information on software packages to implement the PGP or OpenPGP security application. Both OpenPGP and PGP utilize~~s~~ a public key/private key pair to accomplish secure file transfers. The private key must be known only to the company which generated it. The public key counterpart is shared with trading partners.

Each company must generate its public key and private key pair. The RSA key generation algorithm should be chosen for versions of PGP which offer alternatives. Implementers of OpenPGP should choose DSA and El Gamal when creating their key pair. The public keys will be distributed using a secure method (e.g., courier mail) to the company's trading partners. You must use the utmost care in protecting your private key. If it is compromised, the security is broken. It is recommended that a key size of 1024 be chosen when generating the key pair. This provides a significantly secure transaction.

When a company wishes to send transactions to its trading partner, it will use the partner's public key to encrypt the file. Encryption provides data privacy. Only the private key counterpart can decrypt this file. Hence, the need to guard your private key.

When the sending party encrypts the file, it also uses its own private key to "sign" the transaction. The receiving party can use the sender's public key to verify the signature. The digital signature provides non-repudiation.

Encryption / Digital Signature

Encryption and signatures are applied to files already translated to a NAESB ~~WGQ~~ REQ standard data format, and before the data is sent to the batch browser. (Use of internal encryption such as X12.58 encryption is outside the scope of NAESB ~~WGQ~~ REQ encryption

standards but does not conflict with PGP.).

Encryption and signatures can be accomplished manually for each file using the on-line PGP or, on a mutually agreed basis, OpenPGP software, or in an automated (or "batch") fashion using programs to encrypt and sign. Whether encrypting in a manual or automated fashion, it is essential that the correct public key of the trading partner be used to encrypt and just as essential that the correct sender's own private key be used to digitally sign the file.

Digital signatures may also be applied, on a mutually agreeable basis, to the HTTP response by the receiver of the transaction.

Decryption / Signature Verification

After a transaction is received and processed by the CGIreceiving program, it is ready to be decrypted and have its signature verified. PGP and OpenPGP software will utilize the appropriate key pair when encrypting, signing, and decrypting if given the correct userID in the key ring identifying the trading partner. Upon request for signature verification, the PGP and OpenPGP software will return a human-readable company namedescriptive text. (OPEN ISSUE 011)

It is recommended that all implementers create a process where the name descriptive text is used to look up the ID of the company trading partner in a database table. If the ID is passed along with the decrypted file, a process could be created to verify that the company trading partner which sent the transaction corresponds to the company trading partner identified within the file, once the data has been translated. (OPEN ISSUE 011)

When digital signatures are applied, on a mutually agreeable basis, the HTTP response received by the sender of the transaction may be verified to ensure non-repudiation of receipt of the transaction.

Throughput Considerations

Encryption, digital signing, decryption and signature verification are all very CPU intensive. It is not recommended that decryption or signature verification be performed within the CGI program that receives and processes the file. In fact, it would not be a good idea to have these steps performed on the same computer that is attempting to receive transactions at a time close to a deadline. Therefore, it is recommended that the secured or to-be-secured transaction be passed to a separate computer for security processing. This "passing" would likely be accomplished by using the File Transfer Protocol (FTP) or other similar process. The security processing computer should be optimized for CPU and memory.

Implementers of Internet EDM sites should review and evaluate Domain Name Server (DNS) cache refresh intervals so as to ensure trading partner address changes are recognized on a timely basis. A refresh interval of 24 hours or less is common.

Because decryption and signature verification are not handled at the time the file is received, the sender will get an HTTP response of successful transfer but doesn't know if the file can be decrypted by the receiver. Guidelines for communicating the status of the decryption step have been developed. See Section "Sending Error Notification Transactions" and Table A, "Internet EDM Standard Error Codes and Messages".

Security Requirements

Basic Authentication

Basic authentication, also known as realm one security, has been defined as one of the security standards for transmission on the Internet. The userid and password will be assigned by the server party according to site standards. The Ttrading ~~party~~ Partner ~~a~~Agreement must identify the userid and password for this security as well as procedures for changing the password, if applicable. (OPEN ISSUE 008 and OPEN ISSUE 012)

PGP or OpenPGP File Encryption

File encryption of the EDI file is also selected as a security standard for transmission on the Internet. The encryption software employed is required to be compatible with PGP ~~2.6~~6.5 or greater (using keys generated with the RSA algorithm) or the OpenPGP standard, specified in IETF RFC 2440, on a mutually agreed basis. There are freely available software implementations of the OpenPGP standard available at http://www.gnupg.org/.

General Security Recommendations

Firewall

A firewall is one or more computers running special software which is designed to provide control of communications between two networks. Its purpose is to limit the types of services between these two networks. Often, a company's connection to the Internet is intended to provide several other services to its employees who are connected by an internal network such as a Local Area Network or Wide Area Network (LAN or WAN). Examples of these services include access to the World Wide Web, use of e-mail, use of file transfer capabilities and publishing content intended for viewing by the external world on a Web server. In addition, the internal network will likely have connections to host computers which provide internal services such as file and print sharing, fax and database capabilities. So that availability of these services and confidential internal data are not compromised by unwelcome intruders from the Internet, there should exist a protective mechanism between the internal network and the public Internet, the firewall.

There are two general mechanisms employed by firewalls to provide this control: packet filtering and proxy services. Packet filtering examines important components of the messages such as the address of the sending and target computers and the designator (port number) for a specific application running on the target computer. By doing this, it can prevent access to specific computers or programs on those computers. It can also reject messages from certain computers. Proxy servers have various capabilities. They can act as relay agents that can examine attempted use of certain features within an application thus limiting access to these features. They can also hide (by substituting its own address) the internal addresses of clients communicating with external hosts. This hiding makes it difficult for potential attackers to focus on specific internal hosts.

Because firewalls are designed to deal with a broad set of security issues, which may vary at each organization, and are not specific to the use of HTTP, this guide does not attempt to provide specific implementation information. Deciding on a specific firewall architecture, organizational security policies, and choosing between numerous products may require outside

resources to address these issues.

SENDING ERROR NOTIFICATION TRANSACTIONS

Error Notification

When a client sends a file to a server, the server responds to the receipt of the file. Though the file may be received correctly, some further processing must be done, such as decryption and X12 translation. The decryption step which will have a pass/fail status and then the X12 general translation step which will have a pass/fail status. The X12 general translation is merely the check that the file meets the X12 standards and has not been corrupted. Further translation and processing of specific transactions and elements is outside the Internet EDM scope.

When a file passes the decryption step ~~and passes the general translation step~~, no notifying communication is sent back to the client. However, if ~~either~~ the decryption step ~~or the general translation step~~ fails, an error notification must be sent to the client.

In general, this standard format for error notification applies to the posting of an error message after sender's session has been disconnected. This error notification has the potential of occurring only after the original HTTP Response is returned with an "ok" or a warning (WEDM999 format) for the request-status value, not an error (EEDM999).

Additionally, trading partners are permitted to utilize digitally signed error notifications, if both parties mutually agree to do so.

Error Notification Data Elements

The data elements for the error notification are the same as those described in Section "Sending Transactions", with the exception of the "input-format" and "input-data" elements. The file containing the data elements for error notification should not be encrypted.

Required Data Elements for Error Notification (listed in the required order)

Data Element Name	Description
from	Common Code Identifier of sending/client company, the server company which detected the error (OPEN ISSUE 001)
to	Common Code Identifier of receiving/server company, the client company which sent the data set in error (OPEN ISSUE 001)
input-format	"error"
input-data	A text block containing the following items: orig-from — The "from" value from the original transmission orig-to — The "to" value from the original transmission. orig-input-format — The "input-format" value from the original transmission. resp-time-c — The "time-c" value from the original response. resp-server-id — The "server-id" value from the original response. resp-trans-id — The "trans-id" value from the original response. request-status — The new status of the transaction based on some process beyond ~~CGI~~ the receiving process such as decryption; see Table A, "Internet EDM Standard Error Codes and Messages". comments — Any comments the original receiving server wishes to include.

Mutually Agreed Upon Data Elements for Error Notification

none defined at this time

Error Notification "input-data" Element Specifications:

The file containing the data elements for error notification should not be encrypted.

All data element names will be in lower case in the Error Notification.

Carriage returns and line feeds will be ignored in all files.

A field delimiter of "*" will be used in the Error Notification. Please refrain from displaying a "*" anywhere else in the error notification so as not to confuse programs that need to parse on this basis.

No spaces should surround the equal sign or the field delimiter.

The required data elements must appear first in the response.

Additional information can be included after the required elements at the server's discretion.

The first occurrence of the field name within the response will contain the value.

If an error notification is given, a NAESB ~~WGQ~~ REQ Error Notification contains two body parts nested within a multipart/report outer envelope, containing a type parameter with the value "gisb-error-notification". (OPEN ISSUE 014) The first body part contains human readable content in HTML. The second body part contains machine readable content in ~~HTML~~plain text. Additionally, consenting trading partners can mutually agree to digitally sign error notifications. If digital signatures are used, the multipart/report containing the NAESB ~~WGQ~~ REQ Error Notification is used to create a digital signature body part, identified by a content-type of application/pgp-signature. Both the multipart/report NAESB ~~WGQ~~ REQ Error Notification and application/pgp-encrypted digital signature body parts are combined in a multipart/signed envelope.

Error Notification Example:

```
POST /cgi-bin/AS2dispatcher HTTP/1.1
Referer: http://www.get.a.life/upl.htm
Connection: Keep-Alive
User-Agent: brow v0.1 XYZ Corp.
Host: localhost
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg, */*
Content-type: multipart/form-data; boundary=---------------------------87453838942833
Content-Length: 1958
-----------------------------87453838942833
Content-Disposition: form-data; name="from"

234567890 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="to"

123456789 (OPEN ISSUE 001)
-----------------------------87453838942833
Content-Disposition: form-data; name="version"
```

1.46
----------87453838942833
Content-Disposition: form-data; name="receipt-disposition-to"

123456789 (OPEN ISSUE 001)
----------87453838942833
Content-Disposition: form-data; name="receipt-report-type"

gisb-acknowledgement-receipt (OPEN ISSUE 002)
----------87453838942833
Content-Disposition: form-data; name="input-format"

error
----------87453838942833
Content-Disposition: form-data; name="input-data"; filename="c:\temp\error.not"
Content-Type: multipart/report; report-type="gisb-error-notification"; boundary="GISB7868" (OPEN ISSUE 014)

--GISB7868
Content-type: text/html

<HTML><HEAD><TITLE>Error Notification</TITLE></HEAD> <BODY><P>
orig-from=123456789* (OPEN ISSUE 001)
orig-to=234567890* (OPEN ISSUE 001)
orig-input-format=X12*
resp-time-c=19960619102855* (OPEN ISSUE 010)
resp-server-id=coolhost*
resp-trans-id=234423897*
request-status=EEDM601: Public Key Invalid*
comments=Please contact 1-800-555-1212 for correct public key*
</P> </BODY></HTML>

--GISB7868
Content-Type: text/plain

orig-from=123456789* (OPEN ISSUE 001)
orig-to=234567890* (OPEN ISSUE 001)
orig-input-format=X12*
resp-time-c=19960619102855* (OPEN ISSUE 010)
resp-server-id=coolhost*
resp-trans-id=234423897*
request-status=EEDM601: Public Key Invalid*
comments=Please contact 1-800-555-1212 for correct public key*
--GISB7868--
----------87453838942833—

Signed Error Notification

Content-Type:multipart/signed; micalg=pgp-md5; protocol="application/pgp-signature";
boundary=8760

--8760

Content-Type: multipart/report; report-type="gisb-error-notification"; boundary="GISB7868" (OPEN ISSUE 014)

--GISB7868
Content-type: text/html

<HTML><HEAD><TITLE>Error Notification</TITLE></HEAD> <BODY><P>
orig-from=123456789* (OPEN ISSUE 001)
orig-to=234567890* (OPEN ISSUE 001)

```
orig-input-format=X12*
resp-time-c=19960619102855* (OPEN ISSUE 010)
resp-server-id=coolhost*
resp-trans-id=234423897*
request-status=EEDM601: Public Key Invalid*
comments=Please contact 1-800-555-1212 for correct public key*

</P> </BODY></HTML>

--GISB7868
Content-Type: text/plain

orig-from=123456789* (OPEN ISSUE 001)
orig-to=234567890* (OPEN ISSUE 001)
orig-input-format=X12*
resp-time-c=19960619102855* (OPEN ISSUE 010)
resp-server-id=coolhost*
resp-trans-id=234423897*
request-status=EEDM601: Public Key Invalid*
comments=Please contact 1-800-555-1212 for correct public key*

--GISB7868--
--8760

Content-Type: application/pgp-signature
-----BEGIN PGP MESSAGE-----

Version: 2.6.26.5

iQCVAwUBMJrRF2N9oWBghPDJAQE9UQQAtl7LuRVndBjrk4EqYBIb3h5QXIX/
LC//JV5bNvkZIGPIcEmI5iFd9boEgvpirHtIREEqLQRkYNoBActFBZmh9GC3C041
WGquMbrbxc+nIs1TIKlA08rVi9ig/2Yh7LFrK5Ein57U/W72vgSxLhe/zhdfolT9BrnH
OxEa44b+EI=
=ndaj

-----END PGP MESSAGE-----

--8760--.
```

Pre-validation before Decryption

Proper trapping of the range of decryption process errors listed in Table A (Internet EDM Standard Error Messages and Codes) may require program code which is external to the decryption algorithm. Some versions of the PGP software do not explicitly discriminate between EEDM601, EEDM602, EEDM603, and EEDM699 type errors. Under such a circumstance, files inbound to the decryption process should be preprocessed to trap the errors not identified by the PGP version being used. For example, searching the file for the text strings “BEGIN PGP MESSAGE” and “END PGP MESSAGE” can quickly identify “EEDM602 File not encrypted” and “EEDM603 Encrypted file truncated” type errors when the implemented PGP version only identifies decryption success, invalid public key (EEDM601), and decryption failure (EEDM699).

CHECKLIST OF TESTING STEPS (OPEN ISSUE 015)

Purpose

Preliminary steps in testing are helpful before the full batch browser and server applications are

completed. This checklist is intended to provide a series of small achievements leading up to the complete solution.

Client/Browser

NOTE: Throughout all transfer tests, compare files stored on the server against the source file to ensure that the file transferred intact. While transferring to another company's server, you may have to contact that company to send the file back to you so that you can perform the compare.

1. Install an interactive browser. Identify an existing Web server from among NAESB WGQ compliant servers offering interactive upload for test. See the NAESB WGQ home page for a list of organizations willing to act as testing partners. These organizations should have a URL complete with the CGI program name to which a tester may send test files. File content does not need to be X12 or other NAESB WGQ standard format to accomplish this step in testing.
2. Develop or acquire a batch browser that uses multipart for the encoding methodology. Transfer the same test file as in step 1 to the URL not requiring Realm One security.
3. Add Realm One security to your file transfer, and change the URL to the secure URL. Continue transfer tests with your batch browser.
4. Acquire and install PGP or OpenPGP compliant software. Generate your public and private key pair. Make sure to choose the RSA key generation algorithm for PGP or DSA and El Gamal for OpenPGP. Download the test server's test public key. Encrypt your data file using this key. Modify your file transfer to send the encrypted file. Continue transfer tests. Request that the test server contact decrypt your file.

HTTP Server and CGI

1. Install Web server. Establish an Internet connection to your server. Ensure that you have ample storage space for transferred files. Ensure that permissions are granted to the directories.
2. As an optional preliminary step, acquire or develop an HTML page for interactive file upload (sample code is earlier in this document). Test interactive file upload to your own server using an interactive browser.
3. Acquire or develop a CGI program to receive file transfers and process according to NAESB WGQ standards. Test transfers to your CGI using your batch browser.
4. Transfer a X12 or other NAESB WGQ standard format dataset to your server and process it through your translator or other appropriate processes.
5. Copy the CGI to a "secure" directory where Realm One security, or basic authentication, is enabled. Using your batch browser, transfer to both URLs, with and without authentication. Thoroughly test using the incorrect userid and password against the secure directory.
6. Generate a second public/private key pair. Use the second key to encrypt a file and transfer the file to your server. Decrypt the file.
7. Once your site security is established, contact a trading partner to test transfers against your server.
8. Test with various file sizes to ensure that your CGI can process small and large files.
9. Request that several other trading partners and/or several clients within your own company transfer concurrently to ensure that your server can withstand the load.
10. Test application with various simulated errors in both file transfers and in PGP or OpenPGP decryption.

FREQUENTLY ASKED QUESTIONS

As an end user, do I need a continuously connected internet Web server to participate in the Internet EDM in the ~~gas~~ energy industry, or can I just use a dial-up connection to my ISP and my favorite shrink-wrapped browser software?

An interactive browser connection is not enough to actively participate in the system. It is not necessary to have a private Web server, you can use a service, however the system requires that you have access to a permanent internet connection which is capable of both sending and receiving files ~~(with CGI or BGI)~~ without operator intervention.

If we use ANSI X12.58 encryption do we still need to use PGP or OpenPGP encryption?

The use of internal encryption such as X12.58 is outside the scope of the NAESB ~~WGQ~~ REQ encryption standards.

TABLE A - Internet EDM Standard Error Codes And Messages

These errors and warnings are strictly related to problems found in the ~~recipient CGI~~ receiving program or decryption levels of processing before translation. Errors and warnings generated by the client batch browser are assumed to be documented at the client site to distinguish them from problems occurring in the ~~recipient CGI~~receiving program or decryption. Numbering schemes and descriptions should aid in this distinction.

Note: For HTTP-related information refer to the HTTP section of Appendix A ~~error codes see the NAESB WGQ home page~~ for information sources.

EEDM### standard error format with ### representing a numeric value; further processing will not take place

WEDM### standard warning format with ### representing a numeric value; further processing will take place

The string for the error or warning should appear in the following format:

Validation Code:Description;supplemental message to be defined by the issuing site up to 80 characters

Internet EDM Standard Error Codes and Messages

Validation Code	Description	Data Element	Data Element Required or~~vs.~~ Mutually Agreed
EEDM100	Missing “from” Common Code Identifier code	from	required
EEDM101	Missing “to” Common Code Identifier	to	required
EEDM102	Missing input format	input-format	required
EEDM103	Missing data file	input-data	required
EEDM104	Missing transaction set	transaction-set	mutually agreed
EEDM105	Invalid “from” Common Code Identifier	from	required
EEDM106	Invalid “to” Common Code Identifier	to	required
EEDM107	Invalid input format	input-format	required
EEDM108	Invalid transaction set	transaction-set	mutually agreed
EEDM109 (OPEN ISSUE 016)	No parameters supplied	parameter string	required
EEDM110	Invalid “version”	version	required
EEDM111	Missing “version”	version	required
EEDM112	“receipt-security-selection” not mutually agreed	receipt-security-selection	mutually agreed

Validation Code	Description	Data Element	Data Element Required or ~~vs.~~ Mutually Agreed
EEDM113	Invalid “receipt-security-selection”	receipt-security-selection	mutually agreed
EEDM114	Missing “receipt-disposition-to”	receipt-disposition-to	required
EEDM115	Invalid “receipt-disposition-to”	receipt-disposition-to	required
EEDM116	Missing “receipt-report-type”	receipt-report-type	required
EEDM117	Invalid “receipt-report-type”	receipt-report-type	required
EEDM118	Missing “receipt-security-selection”	receipt-security-selection	mutually agreed
EEDM119	Mutually agreed element, refnum, not present	refnum	mutually agreed
EEDM601	Public key invalid	file itself	required - security
EEDM602	File not encrypted	file itself	required - security
EEDM603	Encrypted file truncated	file itself	required - security
EEDM604	Encrypted file not signed or signature not matched	file itself	required - security
EEDM699	Decryption Error		required for general decryption errors not specifically identified by PGP or OpenPGP messages or exit codes
EEDM701 (OPEN ISSUE 017)	EDM party not associated with EDI party		required
EEDM702 (OPEN ISSUE 017)	Data Structure Error		required if the translator does not handle this exception
EEDM703 (OPEN ISSUE 017)	Data set exchange not established for Trading Partner		required if the translator does not handle this exception
EEDM999	System error		required for general system errors to indicate severe errors in processing at the receiving site
WEDM100	Transaction set sent not mutually agreed	transaction-set	mutually agreed
WEDM102	“receipt-security-selection” not mutually agreed	receipt-security-selection	mutually agreed
WEDM103	Missing “receipt-security-selection”	receipt-security-selection	mutually agreed
WEDM104	Element refnum received, not mutually agreed; ignored	refnum	mutually agreed