Gas Industry Standards Board

Future Technology Task Force

Preliminary Report

June 7, 1996

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1. Introduction and Scope

Late in 1995, the Gas Industry Standards Board (GISB) Electronic Delivery Mechanisms Committee (EDM) determined that potential existed for the movement of Electronic Commerce transactions via the Internet or an intranet. To understand the implications of this technology migration further and to propose minimum standards for implementation, a Future Technology Task Force (FTTF) was created.

The task force met several times to discuss the technology and surrounding issues. Minimum standards were proposed and this document identifies those resolutions. All proposed resolutions are minimum standards and parties are encouraged to exceed the minimum standards.

The proposed resolutions are subject to validation through a Pilot Test. A Pilot Test Team was initiated by the task force to test and validate the technology resolutions.

1.1 Summary of Deliverables

The FTTF defined several deliverables that will mark their progress.

- **Preliminary Report** - July 1, 1996
  The Preliminary Report is this document. It defines the proposed standards defined by the FTTF. The report is preliminary as all the proposed standards must be validated by a pilot test.

- **Pilot Team Report** - September 30, 1996
  When the Pilot Test is complete, the Pilot Team will document all their results and any factors that may affect the industry's implementation.

- **Technical Implementation Guide** - September 30, 1996
  When the pilot test is complete and the technology has been validated, an implementation guide will be developed to assist industry participants with implementation of the technology.

- **Future Technology Report**

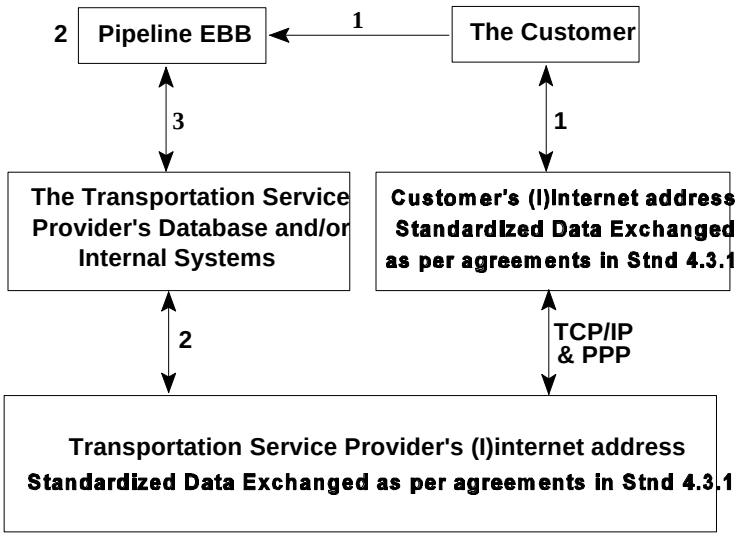
  The FTTF will continue to investigate the best technology for electronic commerce within the natural gas industry. It plans to investigate these issues after July 1, 1996. The FTTF will continue to report their findings and recommendations, as appropriate, to the Executive Committee.

2. Mandate of the Task Force

2.1 Principle

The FTTF is guided by GISB standards and in particular standard 4.3.1:

By 4/1/97, all parties sending and receiving data should accept a TCP/IP using PPP connection. At a minimum, sending and receiving parties should designate an internet address as a designated site for the receipt and delivery of GISB standardized data sets subject to the successful completion of pilot testing by 1/1/97 to ensure that security, performance (within GISB standard data transmission time), and reliability are acceptable. The GISB data file format will be utilized. The Future Technology Task Force will determine the direction of outstanding issues such as security, archiving, receipt notification, etc., by



7/1/96.

Future Technology Model

1. Technology and mechanisms that are at the sole discretion of the customer.
2. Technology and mechanisms that are at the sole discretion of the provider.

2.2 Goal

The GISB Future Technology Task Force (FTTF) will define the minimum standards of technologies and practices that could or should be used to conduct electronic commerce within the gas industry.

2.3 Near-term Objectives

During the inaugural meeting, it was recognized that the Task Force could not investigate all the areas it would like in the time available. The following scope limitation was imposed for the first deliverable of the Task Force, to be completed by 7/1/96:

- "Batch" delivery of the ten GISB High Priority Data Requirement (HPDR) sets.

- Specification of the technology model, issues and recommended standards required to meet the above work requirement.

  The specification must address reliability and operation of the solution. Reliability includes performance, availability, and security. Internet and intranet must be addressed. Operation issues must address ANSI ASC X12 compatibility, notification of sending party that the transaction was received, definition of which party initiates the transaction, and compliance with the mandated 15-minute transaction time guideline.

- Definition and initiation of a pilot test to validate the specification. The test will be completed by 9/30/96.

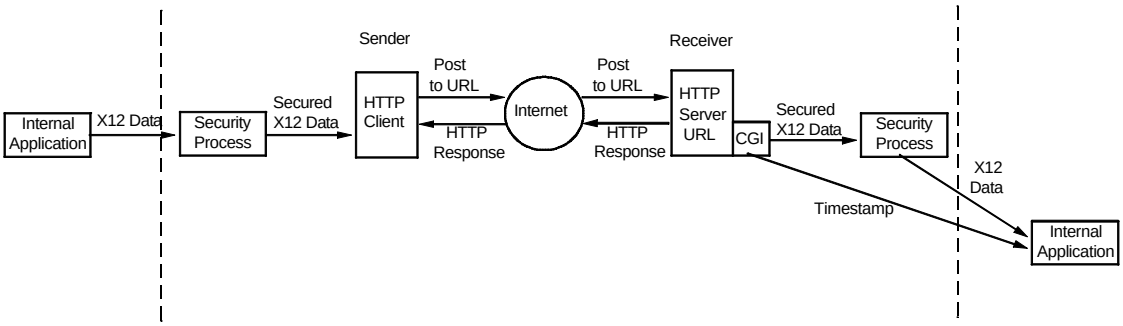
2.4 Long-term Objectives

Items not included in the near-term objectives will be addressed after the 7/1/96 deliverable is completed. This will include recommendations for the transition to more interactive and online electronic commerce solutions. At that time, the FTTF will review data types other than the transactional type addressed by the ten HPDRs.

3. Task Force Results

This section identifies proposed resolutions agreed to by the Future Technology Task Force. All resolutions are subject to validation by the Pilot Test Team.

3.1 Proposed Standards



3.1.1 At a minimum, the designated site must be accessible via the Public Internet. This specifically does not preclude location of the designated site on a private intranet as long as the designated site is accessible via the Public Internet.

3.1.2 The minimum acceptable protocol will be HTTP. All sending and receiving parties must be capable of sending and receiving using HTTP.

3.1.3 There is a timestamp (HTTP Timestamp) that designates the time that a file is received at the designated site. The receiving party must generate a timestamp upon successful receipt of the complete file and send an immediate response to the sending party. The timestamp will be generated by the CGI of the receiving party, prior to further processing by the CGI.

3.1.4 The timestamp will be included in the HTTP response back to the sender of the original HTTP transaction. *It is recommended that the server clock generating the timestamp be synchronized with the National Institute of Standards and Technology (NIST) time in order to mitigate*

discrepancies between the clocks of the sender and receiver.

3.1.5 The HTTP response will be sent to the sending IP address. Other response documents will be returned to the official designated site defined in the Trading Partner Agreement.

3.1.6 As a minimum, within a trading partner agreement, one designated site for receipt will be identified for each trading partner. A DNS host name will be identified rather than an IP address. This does not preclude multiple designated sites being mutually agreed to between trading partners.

3.1.7 The sender will make three attempts to complete a unit of work. After three failed attempts, it will be considered a failure.

3.1.8 The role of the sender and receiver are defined in following table. The entire table defines a unit of work.

Client (Sender)	Server (Receiver)	CGI (Receiver)
	Listen for Connect	
Connect	Accept Connection	
Write	Read	Start of Receipt
Write	Read	
EOF (send)	Read	End of Receipt
		Generate Timestamp
Read (HTTP response)	Write (HTTP response)	
Received		
EOF (HTTP response)		

3.1.9 The FTTF will not set standards for site-level security. Individual organization security standards will be relied upon.

3.1.10 It is recommended that all security features (secure

authentication, integrity, privacy, and non-repudiation) be implemented using a file based approach via a commercially available implementation of PGP 2.6 or greater (or compatible with). Feature implementation will be dependent on evaluation of feature overhead by the pilot test team. This should be regarded as an interim solution since this technology is not an open industry standard. This technology supports all of the above security features while providing independence of choice of Web servers and browsers.

4. Pilot Test Team Summary

4.1 Pilot Test Mission

The GISB Future Technology Task Force (FTTF) Pilot Test Team will identify pilot test participants, establish proper test procedures and implement and test the technology as defined by the FTTF. Upon completion of testing, the group will document the findings and recommend technology guidelines for sending and receiving GISB HPDR datasets in ANSI ASC X12 format using the Public Internet.

4.2 Pilot Test Participants

The Pilot Test will be conducted by numerous companies representing multiple segments of the gas industry. Some of the companies who have expressed an interest in participating in the testing are:

Altra Energy
CNG
El Paso Natural Gas
Energy Tracs
Enersoft Corp.
Enron Interstate Pipelines
Gas Industry Standards Board
Natural Gas Pipeline Company of America
NrG Information Services
Pacific Gas Transmission Company
PanEnergy Corp
Southern California Gas Company
Tenneco Energy

4.3 Pilot Test Scope

The GISB FTTF Pilot Test will implement and test all components of the EDM architecture proposed by the FTTF. The test will validate the technology and document any factors that may affect the industry's implementation. The test will concentrate solely on the use of the Public Internet to transmit X12 formatted datasets and will not address the creation of content or application processing of the X12 data.

4.4 Pilot Test Objectives

The Pilot team has set several objectives for the pilot test.

- Prove the feasibility of using the Public Internet for reliable and timely transmission of HPDR datasets according to the timing requirements specified in the GISB standards.
- Validate the protocol and security components of the architecture.
- Identify performance and scalability guidelines for implementation.
- Discover and document limitations of the architecture.

4.5 Pilot Test Criteria

The pilot test has identified five timestamps to be used in the measurement of test transactions for reporting test results. These are:

(a) the time that the sender (HTTP client) initiates the connection with the server,
(b) the time that the receiver's CGI process receives control from the HTTP Server,
(c) the time that the sender transmits “end of file”,
(d) the time that the receiver's CGI process receives the end of the file,
(e) the time that the sender receives the HTTP response from the receiver.

The pilot test will cover the following scenarios using standard, clearly defined test cases with a common set of test data:

(a) One to one transmission between two trading partners.
(b) Concurrent transmission to and from many trading partners.

These scenarios will be tested with various configurations, including communication directly between trading partners and communication facilitated by third parties. Additionally, testing will include direct and dial-up access to the Public Internet.

Each set of test cases will be repeated at peak and off-peak hours as

related to GISB transaction deadlines several times during a full business month to provide a representative set of results. Variance data will be a key element in the reporting.

The broadest possible representation in the pilot test is desired to encompass all segments of the industry in terms of company size, business role, geographic location, hardware and software platforms. This is deemed necessary for identification of issues relating to implementation, particularly interoperability.

4.6 Pilot Test Deliverables

The Pilot Team will provide several deliverables from testing.

Full documentation of test including:

- the test plan,
- measurement criteria,
- test data description,
- test case definition,
- the configuration of hardware, software, and network, test results

A performance matrix for configurations tested showing transmission times for specified file sizes and connection speeds.

Recommendations for FTTF's implementation guidelines document.