MIME Encapsulation of EDI Objects

Status of this Memo

Table of Contents

1. Introduction

   Electronic Data Interchange (EDI) provides a means of conducting
   structured transactions between trading partners. The delivery
   mechanism for these types of transactions in a paper world has been
   the postal system, so it is to be expected that electronic mail would
   serve as a natural delivery mechanism for electronic transactions.
   This specification permits formatted electronic business interchanges
   to be encapsulated within MIME messages [Bore92]. For the
   specification effort, the basic building block from EDI is an
   interchange.

   This specification pertains only to the encapsulation of EDI objects
   within the MIME environment. It intends no changes in those objects
   from the primary specifications that define the syntax and semantics
   of them. EDI transactions take place through a variety of carriage
   and exchange mechanisms. This specification adds to that repertoire,
   by permitting convenient carriage through Internet email.

Since there are many different EDI specifications, the current
document defines three distinct categories as three different MIME
content-types. One is Application/EDI-X12, indicating that the
contents conform to the range of specifications developed through the
X12 standards organization [X125, X126, X12V]. Another is
Application/EDIFACT, indicating that the contents conform to the
range of specifications developed by the United Nations Working Party
4 Group of Experts 1 EDIFACT boards [FACT, FACV]. The last category
covers all other specifications; it is Application/EDI-consent.

2.   APPLICATION/EDIFACT SPECIFICATION

The Application/EDIFACT MIME body-part contains data as specified for
electronic data interchange by [FACT, FACV].

Within EDIFACT, information is specified by:

MIME type name: Application

MIME subtype name: EDIFACT

Required parameters: none

Optional parameters: CHARSET, as defined for MIME

Encoding considerations: May need BASE64 or QUOTED-PRINTABLE
                            transfer encoding

Security considerations: See separate section in the
                            document.

Published specification: Contained in the following section.

Rationale: The EDIFACT specifications are
                            accepted standards for a class of
                            inter-organization transactions;
                            this permits their transmission
                            over the Internet, via email.

Contact-info: See Contact section, below.

Detail specific to MIME-based usage:

     This is a generic mechanism for sending any EDIFACT
     interchange. The object is self-defining, in terms of
     indicating which specific EDI objects are included. Most
     EDI data is textual, but special characters such as some
     delimiters may be non-printable ASCII or some data may be

pure binary. For EDI objects containing such data, the MIME
transfer mechanism may need to encode the object in Content-
Transfer-Encoding:quoted-printable or base64.

3.   APPLICATION/EDI-X12 SPECIFICATION

The Application/EDI-X12 MIME body-part contains data as specified for
electronic data interchange by [X125, X12.6, EDIV].

Within MIME, EDI-X12 information is specified by:

MIME type name: Application

MIME subtype name: EDI-X12

Required parameters: none

Optional parameters: CHARSET, as defined for MIME

Encoding considerations: May need BASE64 or QUOTED-PRINTABLE
                                transfer encoding

Security considerations: See separate section in the
                                document.

Published specification: Contained in the following section.

Rationale: The ASC X12 EDI specifications are
                                accepted standards for a class of
                                inter-organization transactions;
                                this permits their transmission
                                over the Internet, via email.

Contact-info: See Contact section, below.

Detail specific to MIME-based usage:

    This is a generic mechanism for sending any ASC X12
    interchange. The object is self-defining, in terms of
    indicating which specific EDI objects are included. Most
    EDI data is textual, but special characters such as some
    delimiters may be non-printable ASCII or some data may be
    pure binary. For EDI objects containing such data, the MIME
    transfer mechanism may need to encode the object in Content-
    Transfer-Encoding:quoted-printable or base64.

4.   APPLICATION/EDI-CONSENT SPECIFICATION

   The Application/EDI-consent MIME body-part contains data as specified
   for electronic data interchange with the consent of explicit,
   bilateral trading partner agreement exchanging the EDI-consent
   traffic. As such, use of EDI-consent only provides a standard
   mechanism for "wrapping" the EDI objects but does not specify any of
   the details about those objects.

   Within MIME, EDI-consent information is specified by:

   MIME type name: Application

   MIME subtype name: EDI-consent

   Required parameters: none

   Optional parameters: CHARSET, as defined for MIME

   Encoding considerations: May need BASE64 or QUOTED-PRINTABLE
                               transfer encoding

   Security considerations: See separate section in the
                               document.

   Published specification: Contained in the following section.

   Rationale: Existing practice for exchanging
                               EDI includes a very wide range of
                               specifications which are not part
                               of the usual, accredited standards
                               world. Nevertheless, this traffic
                               is substantial and well-
                               established. This content type
                               provides a means of delimiting such
                               content in a standard fashion.

   Contact-info: See Contact section, below.

   Detail specific to MIME-based usage:

       This is a generic mechanism for sending any EDI object
       explicitly agreed to by the trading partners. X12 and
       EDIFACT object must be sent using their assigned MIME
       content type. EDI-consent is for all other EDI objects, but
       only according to trading partner agreements between the
       originator and the recipient. Most EDI data is textual,
       but special characters such as some delimiters may be non-

         printable ASCII or some data may be pure binary. For EDI
         objects containing such data, the MIME transfer mechanism
         may need to encode the object in Content-Transfer-
         Encoding:quoted-printable or base64.

5.   SAMPLE EDI USAGE IN MIME-BASED EMAIL

   Actual use of EDI within MIME-based mechanisms requires attention to
   considerable detail. This section is intended as an example of the
   gist of the formatting required to encapsulate EDI objects within
   Internet mail, using MIME. To send a single EDIFACT interchange:

   To: <<recipient organization EDI email address>>
   Subject:
   From: <<sending organization EDI email address>>
   Date:
   Mime-Version: 1.0
   Content-Type: Application/EDIFACT
   Content-Transfer-Encoding: QUOTED-PRINTABLE

   <<standard EDIFACT Interchange goes here>>

6.   REFERENCES

   [Bore92]   Borenstein, N., and N. Freed, "MIME (Multipurpose
                Internet Mail Extensions) Part One: Mechanisms for
                Specifying and Describing the Format of Internet Message
                Bodies", RFC 1521, Bellcore, Innosoft, September 1993.

   [Brad89]   Braden, R., Editor, "Requirements for Internet Hosts -
                Application and Support", STD 3, RFC 1123, Internet
                Engineering Task Force, October 1989.

   [Croc82]   Crocker, D., "Standard for the Format of Internet
                Text Messages", STD 11, RFC 822, UDEL, August 1982.

   [Rose93]   Rose, M., "The Internet Message: Closing the Book
                with Electronic Mail", PTR Prentice Hall, Englewood
                Cliffs, N.J., 1993.

   [Post82]   Postel, J., "Simple Mail Transfer Protocol".
                STD 10, RFC 821, USC/Information Sciences Institute,
                August 1982.

   [X12V]   Data Interchange Standards Association; sets of
                specific EDI standards are ordered by their version
                number; Washington D.C.

        [X125]   ANSI X12.5 Interchange Control Structure for
                    Electronic Data Interchange, Washington D.C.: DISA
        [X126]   ANSI X12.6 Applications Control Structures for
                    Electronic Data Interchange, Washington D.C.: DISA

        [FACT]   United Nations Economic Commission (UN/EC)
                    Electronic Data Interchange For Administration,
                    Commerce and Transport (EDIFACT) - Application Level
                    Syntax Rules (ISO 9735), 1991.

        [FACV]   Version sets contains the specific syntax documents,
                    the element and segment dictionaries, and the
                    transaction/message specifications.

7.   SECURITY CONSIDERATIONS

   EDI transactions typically include sensitive data, so that
   transmission often needs to attend to authentication, data integrity,
   privacy, access control and non-repudiation concerns. This
   specification permits transmission of such sensitive data via
   Internet mail and other services which support MIME object
   encapsulation. For transmission of sensitive data, it is essential
   that appropriate security services, such as authentication, privacy
   and/or non-repudiation be provided.

   This specification does NOT, itself, provide any security-related
   mechanisms. As needed and appropriate, such mechanisms MUST be
   added, either via Internet MIME-based security services or any other
   services which are appropriate to the user requirements, such as
   those provided by EDI-based standards.

8.   ACKNOWLEDGMENTS

   Tom Jones offered introductory text and descriptions of candidate
   header options. Numerous working group participants provided review
   and comment, especially Walt Houser, Gail Jackson, and Jim Amster.

9.   AUTHOR'S ADDRESS

   David H. Crocker
   Brandenburg Consulting
   675 Spruce Dr.
   Sunnyvale, CA 94086 USA

   Phone: +1 408 246 8253
   Fax: +1 408 249 6205
   EMail: dcrocker@mordor.stanford.edu

10.   APPENDIX - MIME FOR EDI USERS

   To assist those familiar with EDI but not with Internet electronic
   mail, this Appendix is provided as a very brief introduction,
   primarily to give pointers to the relevant specifications. This
   section is in no way intended to be a thorough introduction. An
   excellent introductory text is [Rose93].

   Internet electronic mail follows the classic user agent/mail transfer
   agent model. In this model, user software produces a standardized
   object which is transferred via standard exchange protocols.

   An Internet electronic mail object comprises a collection of headers,
   followed by a (possibly structured) body. The headers specify such
   information as author and recipient addresses, subject summary,
   creation date, handling node names, and so on, and are defined by
   RFC822 and RFC1123 [Croc82, Brad89]. If the body is structured, it
   conforms to the rules of the Multipurpose Internet Message Exchange
   (MIME) [Bore92]. A structured body may have parts encoded in
   different text character sets, or even of entirely different types of
   data, such as voice or graphics.

   The Simple Mail Transfer Protocol (SMTP) [Post82, Brad89] performs
   the primary task of message transmission. User posting and delivery
   interactions, between the user agent and the message transfer agent,
   on the same machine, are not standardized and are platform-specific.

   An EDI-related use of Internet Mime email will have (at least) the
   following components:

       Business Program/Data base -> EDI Translator ->
       -> MIME encapsulation -> RFC822 packaging -> mail
       submission ->
       -> SMTP relaying ->
       -> mail delivery -> RFC822 & Mime stripping ->
       -> EDI Translator -> Business processing

   The first and last lines show components normal to all EDI activities,
   so that it is only the EDI "transmission" components that are replaced
   with Internet modules.