                        EDI Meets the Internet

                   Frequently Asked Questions about
              Electronic Data Interchange (EDI) on the Internet

Status of this Memo

   This memo provides information for the Internet community. This memo
   does not specify an Internet standard of any kind. Distribution of
   this memo is unlimited.

Abstract

   This memo is targeted towards the EDI community that is unfamiliar
   with the Internet, including EDI software developers, users, and
   service providers. The memo introduces the Internet and assumes a
   basic knowledge of EDI.

Table of Contents

1. Introduction

1.1. What is this document

   This document is informational in nature and attempts to answer
   frequently asked questions concerning the use of the Internet for
   Electronic Data Interchange (EDI). The primary audience is the EDI
   community that is unfamiliar with the Internet, including software
   developers, users, and service providers.   The reader needs some
   understanding of EDI. Informational RFCs are prepared by the
   Internet Engineering Task Force (IETF) to improve understanding and
   effectiveness in the use of the Internet.

1.2. What do you mean by electronic data interchange (EDI) ?

   Except as noted, the document refers to EDI as the use of the

        1) X12 standard developed by the ANSI Accredited Standards
           Committee X12 or

        2) EDIFACT[1] standard United Nations Economic Commission for
           Europe (UN/ECE), Working Party for the Facilitation of
           International Trade Procedures (WP.4).

   The differences between these standards is beyond the scope of this
   FAQ. Both standards activities are managed in the US by:

                Data Interchange Standards Association, Inc,
                1800 Diagonal Road, Suite 200
                Alexandria, Virginia, 22314-2852
                Voice: 703-548-7005
                FAX: 703-548-5738

   There are numerous other standards one could use for EDI, but
   discussion of them is not in the scope of this document.

1.3. What are the X12 Standards that I should be aware of ?

   ACCREDITED STANDARDS COMMITTEE (ASC) X12 Standards are available from
   DISA at the address specified in Question 1. The following is a good
   starting set of X12 standards.

        1. ASC X12S/94-172, An Introduction to Electronic
            Data Interchange, DISA 1994 Publications Catalog

          2. ASC X12.3 Data Element Dictionary
          3. ASC X12.5 Interchange Control Structure
          4. ASC X12.6 Application Control Structure
          5. ASC X12.22 Segment Directory
          6. ASC X12.58 Security Structures

1.4. To whom do I send comments and suggestions ?

     Readers are invited to add questions; please include an answer if you
     know or want to suggest one. Of course corrections and comments are
     welcome; send them to the IETF-EDI mail list by subscribing as
     described in question 7.6. Or a send your comment to
     houser.walt@forum.va.gov.

1.5. How can I get a copy of this document?

     Request for Comments documents (RFC) are available by anonymous FTP.
     Login with the username "anonymous" and a password of your e-mail
     address. After logging in, type "cd rfc" and then

          "get rfc1865.txt".

     A Web address for the RFC is:

        ftp://ds.internic.net/rfc/rfc1865.txt

     RFC directories are located at:

          o Africa at: ftp.is.co.za   (196.4.160.2)
          o Europe: nic.nordu.net   (192.36.148.17)
          o Pacific Rim: munnari.oz.au   (128.250.1.21)
          o US East Coast: ds.internic.net (198.49.45.10)
          o US West Coast: ftp.isi.edu   (128.9.0.32)

     RFCs are also available by mail. Send a message to:
     mailserv@ds.internic.net. In the body type:

          "FILE /rfc/rfc1865.txt"

     NOTE: The mail server at ds.internic.net can return the document in
     MIME-encoded form by using the "mpack" utility. To use this feature,
     insert the command "ENCODING mime" before the "FILE" command. To
     decode the response(s), you will need "munpack" or a MIME-compliant
     mail reader. Different MIME-compliant mail readers exhibit different
     behavior, especially when dealing with "multipart" MIME messages
     (i.e., documents which have been split up into multiple messages), so
     check your local documentation on how to manipulate these messages.

2. General Information

2.1. What is the Internet ?

   It is the inter-working of existing corporate and government networks
   using commonly used telecommunications standards. It is not a new
   physical network, although some new facilities may be needed.
   Rather, it is based on mutual interests of users to communicate more
   effectively via electronic message and file transfers. Internet
   communications may be interpersonal (person-to-person) E-Mail or
   process-to-process like EDI. Messages may be inquiries to shared
   databases and responses. Messages may be entire files.

2.2. Is there a difference between EDI and electronic commerce (EC) ?

   Electronic Data Interchange (EDI) is defined as the inter-process
   (computer application to computer application) communication of
   business information in a standardized electronic form. Electronic
   Commerce includes EDI, but recognizes the need for inter-personal
   (human to human) communications, the transfer of moneys, and the
   sharing of common data bases as additional activities that aid in the
   efficient conduct of business. By incorporating a wide range of
   technologies, EC is much broader than EDI. However, the focus of
   this document in on EDI, not electronic commerce.

2.3. What makes the Internet useful for EDI ?

   The greatest benefits will derive from:

      o Adoption of common standards and proven inter-operable systems,

      o Adoption and deployment of a distributed Directory Service
         capability, so that one can readily contact electronically any
         other organization in the world.

      o Explicit commitment by participating organizations to
         cooperatively route traffic, work to resolve addresses, and
         meet required standards.

      o Ubiquitous network coverage from many service providers. This
         allows the customer to choose the level of service needed.

      o Layering of applications (such as EDI) over existing, proven,
         applications.

      o A standards process with reference implementations which
         all vendors have equal access. (a.k.a. a level playing field).

        o Widely available public domain software including but not
           limited to applications, protocol/transports and multiple
           platform development tools.

2.4. Does this means we will now have to coordinate our EC/EDI
      activities with the Internet?

   The Internet is not an organization or government agency. You use
   the Internet to do business like you would use the telephone. The
   same Internet connection your organization uses to send electronic
   mail would be the one you use to send EDI transactions. Software
   developers write EDI translators, packages or templates for your e-
   mail system so that you can handle your own EDI transactions. Your
   EDI activities do not need to be coordinated, but your connection to
   the Internet does.

2.5. How do I find the addresses of other Trading partners on the
      Internet if I don't have to coordinate my EDI activities with
      a central organization or VAN?

   The Internet works by assigning names or "domains" to
   networks/companies/machines. This is called the Domain Name Service
   (DNS). It works from a distributed tree structure. The Internet
   requires registration of your Internet Protocol (IP) address and
   Domain Name in the Domain Name Service (DNS). Your internet service
   provider can do this for you or assist you in contacting the right
   people to get your assigned addresses and domain names.

2.6. How fast is the Internet?

   For a modest amount of data with a dedicated connection, a message
   transmission would occur in a matter of seconds, unless the ISP
   selected one of the trading partners is overloaded. The maximum
   delay over the internet backbones is at most a few seconds. Like the
   interstate highway system, speed depends on how close you and your
   trading partner are to Internet backbones. Unfortunately, some areas
   may lack the capacity or "bandwidth" to handle the workload your
   organization requires. Contact your local Internet Service Provider
   for details on service in your area. Also, the more you are willing
   to spend, the better the service. The Internet is inexpensive, but
   (contrary to popular mythology) it is not free.

2.7. What about reliability of the Internet?

   For high reliability mission critical applications, redundant ISPs
   may be used (with separate backbones), and redundant mail servers at
   separate locations can be used. A single internet email or server
   address can be used to transparently route to any of the redundant

servers or network connections.

If a dedicated Internet connection is used to transmit information,
e.g., via SMTP (see questions 3.2 and 3.5), then the message is
delivered directly to the trading partner's system and delivery is
assured. If a part time store and forward connection is used, then
the integrity of the message depends on the ISP or other computers
used in the forwarding of a message.

2.8. What are RFCs and where can I get them ?

RFC stands for Request For Comments. The RFC series of notes covers
a broad range of topics related to computer communications. The core
topics are the Internet and the TCP/IP protocol suite. There are
three categories of RFCs today, Standards Track, Informational, or
Experimental. Many of the RFCs describe de-facto standards in the
Internet Community. Copies of RFCs are often posted to the USENET
newsgroup comp.doc and obtainable from archive sites such as
ds.internic.net.

                    ftp://ds.internic.net/rfc/

2.9. Where can I get general information about the Internet?

Your local bookstore probably has one of the many recent introductory
publications on the Internet. In addition, look for (or have someone
get you) the following bibliographies for free:

     RFC 1175
          Bowers, K., LaQuey, T., Reynolds, J., Roubicek, K.,
          Stahl, M., and A. Yuan, "FYI on Where to Start -
          A Bibliography of Internetworking Information",
          08/16/1990 (FYI 3)

               ftp://ds.internic.net/rfc/rfc1175.txt

     RFC 1463
          Hoffman, E., and L. Jackson, "FYI on Introducing the
          Internet -- A Short Bibliography of Introductory
          Internetworking Readings for the Network Novice",
          05/27/93 (FYI 19)

               ftp://ds.internic.net/rfc/rfc1463.txt

The reader may want to look at the Frequently Asked Questions (FAQ)
document for the newsgroup alt.internet.services. This FAQ, as well
as all Usenet FAQs, can be retrieved via ftp from rtfm.mit.edu in the
directory /pub/usenet/news.answers. These FAQs are also available

   from ftp.sterling.com in the directory /usenet/news.answers.

3. Getting Connected To The Internet

3.1. What do I need to get to use the Internet?

   You need to know your existing telecommunications connectivity,
   address resolution, and routing capabilities. Then you need to
   establish and operate an Electronic Mail gateway and/or other
   application gateway, e.g., for the file transfer protocol (FTP).
   Larger organizations may supply their trading partners with the
   TCP/IP software and X12 translator interfaced to E-mail or FTP.

3.2. What software is used to support electronic mail?

   a) Simple Mail Transfer Protocol (SMTP) Servers

      A dedicated internet connection usually uses SMTP software to send
      and receive messages. The SMTP server may transfer messages to the
      "spool" area for incoming email in the file system, may queue the
      messages for transmission via UUCP, may hold mail in a POP server,
      or may transfer the message to a proprietary email system.

   b) Unix-to-Unix Copy (UUCP) Servers

      A UUCP server is used to transfer messages when a store and
      forward is used, either between machines within a WAN, or to
      another machine with a dialup link.

   c) Post Office Protocol (POP) mail Servers

      A POP server holds email which can later be retrieved by a client
      application run by the user, typically on a PC which might not be
      running 24 hours a day. The TCP/IP protocol is used either over a
      LAN or dialup SLIP connection to retrieve messages.

   d) Mail User Agents (Mail Readers)

      Uses or applications employ client programs to retrieve and
      display email messages from the file system mail spool area, or
      from another server computer using POP or some other proprietary
      protocol (e.g. Microsoft-Mail). This mail user agent (UA) software
      is also used to compose and send email via a POP server or system
      email.

      The mail user agent may also process attached files using a
      proprietary format within a mail message, using one of the common
      de-facto standards, or using the Multipurpose Internet Mail

Extensions (MIME) internet standard. Among other things, MIME
permits the identification and concatenation of message parts
(called "body parts") into a single message that can traverse the
Internet using the SMTP protocol. The Work in Progress, "EDI in
MIME" provides the necessary standards for MIME compliant user
agents to identify EDI body parts. A MIME compliant mail reader
can process the contents of the messages and dispatch data to
external software. For example, files can be dragged to file
system directories, images can be displayed, and audio data can be
played. In the case of EDI, a message formatted according to the
MIME-EDI specification could be automatically transferred to an
EDI processing program.

e) Automated Mail Processing

A typical Mail User Agents is an interactive application. However
there are automated email message processing programs which can
sort incoming mail, process forms returned by others, or in the
case of EDI data, transfer the message contents to the EDI system.
Messages formatted according to the MIME EDI specification can be
properly recognized by any MIME compliant mail processing program.

3.3.   What types of client-server or server-server protocols exist on
       the Internet?

Internet email is typically used for two party messaging. The FTP,
gopher, and HTTP protocols allow many users, possibly anonymous, to
retrieve data from a central source. For example, corporate catalogs
can be restricted by potential customers.

a) File Transfer Protocol (FTP)

Companies with existing connectivity to the Internet may use FTP
to transfer files to one-another or to their VAN. This solution
employs the same TCP/IP used for SMTP. Furthermore, Internet
documents such as EDI in MIME Work in Progress are available via
FTP on the FTP server "ds.internic.net."

b) gopher service protocol.

Gopher service is a way of organizing selected documents and files
on an Internet server in a simple tree menu, so that users on
other Internet computers can find them easily. Most gopher menus
are also linked to other gopher menus elsewhere, so that users can
easily jump from one Internet server to another. There are
thousands of gopher servers in operation worldwide.

c) The Hypertext Transfer Protocol (HTTP)

   HTTP defines http-server and http-clients that comprise the World
   Wide Web (WWW). WWW was developed by the European Laboratory for
   Particle Physics (CERN) as a tool for exchanging multimedia data
   between researchers. Although there is also no specification for
   graphics in HTTP, most web browsers are graphical in nature.
   Mosaic, available free from the National Center for Supercomputer
   Applications (NCSA), provides a Graphical User Interface (GUI)
   that facilitates user access to information on the Internet.
   Mosaic interprets hypertext based information on the WWW, as well
   as to other linked Index/Directory services such as Archie, FTP,
   Gopher, and X.500 Directory information. Mosaic also supports on
   line Graphic Interchange Format (GIF), Joint Photographic Experts
   Group (JPEG), Motion Picture Experts Group (MPEG), QuickTime, and
   other document, image, and audio types. Vendors have developed
   product catalogues using Mosaic servers.

d) WHOIS

   WHOIS servers generally offer information about the organization
   to which they belong. There are many WHOIS servers scattered
   throughout the Internet. To obtain a list of registered WHOIS
   servers, anonymous FTP to rtfm.mit.edu and get the file
   /pub/whois/whois-servers.list. You can:

   o   run a client program on your own machine to access the
       WHOIS server,

   o   telnet to a site which hosts the server, eg: telnet to
       whois.internic.net and type help to access the full online
       help

   o   send an email message to retrieve information from the
       database. eg: send email to mailserv@internic.net with
       a command in the Subject field. Any information in the
       body part of message will be ignored. ie.

           Subject: whois <search string>

       Therefore, to find information on the Internic Registration
       Service, the subject should contain: whois internic

       Moreover, to obtain help information on this service you can
       send two separate email with the following in their subject
       line, respectively:

```
                    help
                    whois help
```

3.4. What methods exist to broadcast information across the Internet?

   There are also some usual methods to broadcast messages to multiple
   recipients as described below:

   a) Usenet News

      Usenet news is a cooperative broadcast of messages to all
      participants. Messages are organized into categories called
      newsgroups, and there are over 10,000 newsgroups carried by the
      major ISPs. Individual customers typically subscribe to some
      subset of these which is of interest to the organization.
      Messages are typically held for a week or two, then either
      archived or discarded. Some newsgroups are free form, i.e. anyone
      can post a message, while others are "moderated", i.e. require
      approval prior to posting.

      Though not currently used for any type of EDI, Usenet news could
      be used to broadcast RFQs. For example, comp.newprod is used to
      announce new products, and misc.jobs.wanted is used to announce
      job openings.

   b) Mailing Lists

      If the interest is limited, a mailing list may be used in lieu of
      a newsgroup. These are typically used for discussion groups or
      announcements of a particular nature. Mailing lists are typically
      open, i.e. anyone can "subscribe" by sending an email message to a
      server. For discussion groups, anyone can send a message to the
      server which is then rebroadcast to all subscribers. Since
      Internet email is extremely inexpensive, there is normally no
      charge for use of a mailing list, except for the content of
      e-magazines, etc. Sponsors of an email list typically provide the
      list as a public service.

      For example, a mailing list could be used to broadcast EDI RFQs,
      etc. Vendors might subscribe to various lists related to their
      product or service in order to receive messages sent by potential
      customers. Mailing lists could be provided by large companies for
      internal use, by industry organizations, or VANs. For example, a
      firm or government agency could sponsor various mailing lists for
      EDI RFQ's, new product announcements, etc. related to procurement.
      The organization could easily allow other potential customers to
      use the same mailing lists to contact vendors. All parties would
      benefit, and the improved access to vendors from an open mailing

list would more than offset the cost to support the mailing list
server. Thus service might be available for free.

3.5. What are the ways to connect to the Internet ?

The following provides a general overview of connectivity options now
available:

a) Dedicated Connection

Typically a leased telephone line is used to connect a gateway
computer or Typically a leased telephone line is used to connect a
gateway computer or bridge/router of a corporate LAN/WAN to the
router of the Internet Service Provider's (ISP) Point-Of-Presence
(POP, not to be confused with the Post Office Protocol). The
connection may be of various types and speeds, e.g. modem, ISDN,
DS0, or DS1 line.

With a dedicated connection, the SMTP protocol is typically used
to deliver email directly to a trading partners system. Also,
real-time client server applications can be run directly with a
trading partners system, including information transferred using
the FTP and HTTP protocols.

Some ISPs provide optional services even with dedicated
connections. For example, store and forward email on an ISP
server can be used as a backup for a direct SMTP server operated
by a trading partner. The ISP may offer disk space on their FTP
and HTTP servers with a high speed connection to the Internet.
For example, a trading partner might use a 14.4Kb modem for
dedicated email transfers and use a 1.5Mb connection operated by
the ISP to distribute FTP and HTTP information.

b) On-demand Connection

An on-demand connection operates like a dedicated connection,
except a dialup ISDN or modem connection is used. If the link
remains idle for a certain period of time, the connection is
dropped. Some ISPs offer dial-out capability so any inbound or
outbound traffic can reestablish the link. However, many ISPs
require their customers to dial-in, so only outbound traffic and
regular polling will establish the link. In the latter case, store
and forward would likely be used for email, and the ISP servers
would be used for FTP and HTTP information.

c) Part-time Polled Connection

   The Unix-to-Unix Copy (UUCP) protocol is typically used for email,
   news, and (rarely) file transfers. A client organization
   periodically dials the ISP and transfers email and Usenet news for
   the organization, then disconnects. Typically, the client polls
   the ISP at regular intervals, e.g. every 20 minutes, though some
   ISPs dial out when a message is to be delivered. Outgoing email
   can be sent immediately, or queued for transmission with a
   specified maximum delay.

   A UUCP connection may be used to transfer messages to an arbitrary
   number of people or automated mail processing programs. A single
   UUCP connection may also route messages to other systems, e.g.
   divisions within a corporation. UUCP and store-and-forward are
   synonymous.

   Since UUCP is only used to transfer mail and news messages,
   interactive internet client-server applications like FTP and HTTP
   are not available, except using a server provided by an ISP. Thus
   a separate dialup account might be needed to retrieve information
   from other FTP or HTTP servers. UUCP might be used for automated
   email transfer, and a on-demand dialup connection would be used
   for interactive internet client applications.

   Though UUCP accounts imply a delay (up to the polling interval) in
   processing a message, many ISPs allow a customer supplied script
   to process messages immediately on the ISP's machine. Though UUCP
   can be used to transfer files directly, usually files are
   transferred by encoding them within an email message.
   Transmission within internet email messages is much more widely
   supported and can be gatewayed into proprietary systems.

d) Dial-up Shell Account

   With a dial-up account, a single user with a personal computer
   running a terminal emulator connects to the ISP's computer. Mail
   readers, news readers, HTTP browsers, etc. can be run on the ISP
   machine. Data on the ISP machine can be transferred to the
   personal computer manually using a protocol like X-Modem, Z-Modem,
   or Kermit.

   The ISP's host computer may run one of the usual UNIX command line
   (shell) programs, or may use a custom BBS or other menu driven
   user interface. A proprietary client-server program may be used in
   lieu of a terminal emulator to provide a graphic user interface.
   Some of the proprietary GUI clients provide access to selected
   internet applications, e.g. gopher.

A dialup ISP typically has a direct internet connection, however
very low cost providers might only have a UUCP connection to the
Internet. Some large proprietary networks such as CompuServe do
not offer a direct internet connection, and only support UUCP
email and, sometimes, Usenet news gateways to the Internet.

d) Personal Serial Line Internet Protocol (SLIP) or Point to Point
Protocol (PPP) Account

A SLIP/PPP account is also available as a cross between the on
demand and dial- up. Like the on-demand account, a single user can
connect to an ISP and run mail reader, news reader, FTP, HTTP
browser, etc. client applications directly from a personal
computer. Unlike the on-demand account, the dial-out computer
functions as a client only and not a server, and would be used by
a single user rather than as a gateway to a LAN.

With a SLIP/PPP account, the POP (Post-Office-Protocol) protocol
is used for a user's mail reader client to retrieve messages
stored in the ISP's server. Unlike, UUCP, the POP servers hold
mail for a single user (i.e. individual email address).

With a SLIP/PPP connection any standard TCP/IP application is tied
directly into the internet. Thus unlike the proprietary GUI
software supplied by the ISP, any TCP/IP client application can be
used.

A program such as TIA (The Internet Adapter) can be run on a shell
account which allows a standard UNIX shell account to function as
a SLIP/PPP account. However, some ISPs do not support TIA as they
charge extra for SLIP.

4. Organizational Issues

4.1. Why is the way we currently do EDI so limiting to its growth?

There is a tendency for each organization to establish is own rules
and administrative policies, leading to rising costs of dealing with
multiple trading partners, each in turn with its own requirements and
procedures. However, new technologies and business practices are
necessary if EDI is to move beyond the 30 to 40,000 organizations
presently using EDI. According to Department of Labor and Internal
Revenue Service statistics, there are about 6.2 million entities with
employees and about 14 million other "business" entities. A business
that wants to sell chairs, for example, would have to check with many
different customers to see if they had any requirements. By making
it possible for a business to use a common method to look for
customers, the barriers entering to the electronic marketplace are

greatly eased. This does not mean that there is only one source that
everyone goes to for a list of current business opportunities.
Rather, a prospective supplier only needs to go to a single
electronic marketplace. To communicate with each other, the various
participants in electronic commerce need to harmonize their
procedures and processes. Examples include common trading partner
registration and the adoption of standard implementation conventions
for EDI messages.

4.2. My organization has an internal automated system for processing
      requisitions and issuing purchase orders, but it does not create
      the X12 formatted EDI transactions; what should we do ?

   You could enhance your existing system, for example, by adding EDI
   translation software. VANs often offer EDI "translation"
   capabilities that convert flat text files into EDI X12 or EDIFACT
   format. This translation software may be designed with a particular
   technical solution in mind; carefully consider how the software would
   be used and what applications and telecommunications software would
   need to interact with it. You don't want to inadvertently lock
   yourself into using only one supplier.

4.3. My organization already has a dial-in bulletin board service
      (BBS) where we post transactions; should we keep it?

   Yes, but that puts you in the role of being your own VAN. By acting
   independently, organizations have established their own dial-up
   electronic bulletin board system with their own unique, but
   functionally equivalent, operating rules. Your BBS will be a little
   different that the next organization's, making it difficult for
   suppliers to access. By getting transactions from the VANs who
   specialize in moving information, your organization will get the
   widest circulation possible. You will be able to reach trading
   partners you may not even know existed, resulting in more competitive
   bids. Because of their idiosyncratic nature, BBS are not consistent
   with the idea of a "single face to industry" espoused by the Federal
   Government.

4.4. My organization currently has a Trading Partner Agreement
      with each trading partner we're currently doing business with.
      Can we keep them ?

   In the short run you may want to keep some Agreements in place to
   cover unique circumstances. But be careful not to create conflicting
   agreements and directions for your trading partners. Follow the
   procedures common to your particular line of business. In the long
   run, less is better. Hopefully, the introduction of EDI into common
   commercial practice will eliminate the need for EDI-specific

     agreements.

4.5. It would be nice to get more trading partners and/or more
      competition, but I'm worried about getting too many transactions
      to be able to handle them. Has this been a problem ?

   The answers to this and related questions presupposes a willingness
   to participate in the open bidding process. While this process is a
   legal requirement for government agencies, many private organizations
   choose not to adopt the practice. The technology of the Internet
   facilitates competition, but the cost of putting these practices in
   place limit their value. This is a business decision, not a
   technical one. Will companies competitively procure critical
   supplies absent a long term relationship with the supplier? For
   essential inputs that will make or break customer satisfaction and
   productivity, the benefits of competition may not be worth the risks.

   Many organizations experience some increase in the number of
   transactions; for competitive procurements, the winning bid should be
   significantly better than those received prior to using the
   electronic system. The impact of an increase in volume needs to be
   evaluated on a situation by situation basis. For example, your
   acquisition support system may need to be re-engineered to quickly
   handle bids by ranking and presenting them to your buyers in low to
   high order. Your new or enhanced system should make it easy to
   receive and reply to any inter-personal messages that are sent and
   linked to a bid (that is, an SMTP/MIME message or the EDI X12.864
   text message transaction set).

4.6. Does this mean that I'll receive more messages ?

   There is a strong likelihood the number of messages will increase as
   There is a strong likelihood the number of messages will increase as
   you reach more and more trading partners. After a reasonable trial
   period, your EDI trading partners should be relying on EDI and
   disinclined to use alternative forms of communication that don't fit
   EDI/EC. Once you use EDI/EC to communicate with a trading partner,
   you should consider discouraging the use of telephone calls or fax
   messages or other non-EDI/EC messages by pointing out the fact that
   telephone or fax messages are processed more slowly. By using
   electronic messaging, you can establish a written and dated audit
   trail. Your application system can route the message to the buyer
   and "attach" it to a "case file". However, if your organization does
   not use automated systems, you will want to adjust your approach to
   dealing with non-EDI messages.

4.7. If we see a transaction posted on VAN, how do we respond in
      electronic format ?

      This function is typically handled by applications software, not by
      the Internet. For example, a vendor that wishes to bid on a
      particular Request For Quotation (RFQ) would prepare a bid (X12-843)
      and send it via their VAN of choice. The identification information
      in the interchange control header (ISA) and functional group header
      (GS) will be interpreted by your VAN and forwarded to the buyer's VAN
      or to the buyer directly, depending on the reply address. VANs may
      reject messages from unregistered sources; otherwise they are
      forwarded to (or otherwise made available to) the buyer. If a buyer
      is using dial-up access to a VAN, then they will have to call-in for
      their messages.

4.8. My organization has an established bilateral relationship
      (such as an existing contract. Can we send these transaction
      via the Internet ?

      Yes, the Internet can be used to send transaction sets to existing
      trading partners via SMTP or FTP messages. VANs were typically used
      for bilateral relationships between companies, whereas the Internet
      is useful for establishing multilateral relationships. These
      bilateral relationships are usually quite stable, but both parties
      had to agree to share the same VAN or get their VANs to interconnect.
      Multilateral relationships are between organizations that don't
      necessarily have existing relationships and may be rather ephemeral.
      The Internet is suited to dynamic multilateral relationships that may
      later evolve into static bilateral relationships between companies
      using VANs. Therefore, the issues concerning the Internet (security,
      availability, etc.) are manageable in the early stages of forming a
      relationship. If your current VAN is not capable of using the
      Internet, you may need an alternative route for those messages.
      Later, as the business relationship matures, the use of VANs may be
      appropriate as the level of communication becomes more important.
      For example, unless your system has a directory of all registered
      trading partners, you lack the capabilities to screen and validate
      transactions that arrive at your site.

5. The Role Of Value Added Networks

5.1. What is a VAN?

      The use of EDI over the Internet is in the early stages, although the
      technology and services are developing remarkably rapidly. In the
      past, organizations doing EDI typically have relied on specialized
      firms called Value Added Networks (VANs) for technical assistance.
      Many of these organizations will look to their VAN for assistance in

   using the Internet. VANs specializing in EDI applications provide
   technical support, help desk and troubleshooting for EDI and
   telecommunications problems. They assist in configuration of
   software, upgrades to telecommunications connectivity, data and
   computer security, auditing and tracing of transactions, recovery of
   lost data, service reliability and availability. Some EDI specific
   services can include broadcasting an RFQ to a collection of vendors,
   or storage of EDI information for later search and retrieval.

5.2. What is an Internet Service Provider (ISP)?

   VAN services have typically used proprietary network or a network
   gatewayed with a specific set of other proprietary networks. In
   contrast an Internet Service Provider (ISP) offers generic network
   access (i.e. not specific to EDI) for all computers connected to the
   internet. A direct internet connection permits real time computer-
   computer communication for client-server applications.
   Alternatively, a part time internet connection can be used to access
   internet servers using an on-demand basis, or access another system
   via email which includes a store and forward method. Internet email
   may be used as a gateway to proprietary networks if the proprietary
   network has an email gateway.

5.3. How might an ISP be used for EDI?

   Internet email can be configured for a dedicated connection with
   real-time transfers, or a store and forward method (like traditional
   VANs), or a combination of the two, e.g. where a direct delivery to a
   trading partners system is used when a link is operational, and a
   store and forward from an ISP is used as a backup.

   A large organization can connect their network to the Internet at an
   internet exchange point, however, most use a commercial ISP, either a
   major backbone provider, or local resellers of service off one or
   more backbones. The ISP provides technical assistance and access to
   local telecommunications links.

5.4. Doesn't EDI presume the services of companies called
      Value Added Networks (VANs)?

   EDI only specifies a format for business information; the
   transmission of the information is covered under other standards. A
   real world analog is sending a business form from one company to
   another. The "form" could be sent via US mail, US Registered mail,
   via private carrier (UPS/FEDEX) or simply faxed between the
   companies. EDI only requires that the trading partners follow the
   content standards.

5.5. If I can use X12 protocol and my VAN to send transactions,
      what is the benefit of using the Internet?

   The Internet E-mail standards have hierarchical address spaces that
   are defined and updated in what the Internet calls "domain name
   servers." Unfortunately, X12 has a flat address space. So, when you
   send an interchange (not via the Internet) to a partner who is on a
   different VAN, your VAN must do a table look up to figure out what
   VAN the receiving party is on. If you use only X12 without the
   Internet, before you can send a message to this partner, you must
   first contact the recipient's VAN and have them add you as an entry
   to his VAN's table. If the ISA contained the VAN ID of the
   recipient, then you could (in theory) send interchanges to partners
   via the VAN interconnects without having to notify the recipient's
   VAN first. However, this theory needs to be worked out in practice.
   In contrast, thanks to the domain name service, Internet e-mail users
   (and Postal users) don't have to call up their service provider
   before sending a message across an "interconnect" to another service
   provider.

5.6. Can we expect VANs to offer connections to other VANs via the
      Internet?

   All VANs connected to the Internet are connected to one another, thus
   avoiding most of the problems of interconnecting proprietary
   networks. VANs can then focus on services to their customers such as
   automatic bid submission, market and business opportunity analysis,
   and translation software.

5.7. How can I use the Internet directly for exchanging EDI messages
      without going through a VAN?

   You and your trading partner must agree on one of the Internet
   protocols for exchanging messages and then agree upon some details
   with the exchange.

   a) Email based messaging

      The simplest and most widely supported means of exchanging
      messages is via internet email. Typically, the IETF-MIME
      encapsulation specification would be used to enclose the EDI
      data within the email message, and the trading partners would
      need to agree upon an encryption method for secure email,
      typically PEM or PGP (see question 8.4).

      The trading partners would then exchange:
          1. The internet email address for EDI messages
          2. An internet email address for personal communications

                related to EDI
        3. Agreement on the encryption and digital signature
           protocols, including email acknowledgment, e.g.
           support for the "Return-Receipt-To:" email header,
           or X.400 extended email header fields.
        4. Public Keys for PEM or PGP encryption and digital
           signatures. (or private keys for DES encryption)
        5. Agreement on the format of the message, e.g. IETF MIME/EDI.

     A convention for naming email addresses might be
     established, e.g. edi@edi.xyzcorp.com for messages,
     ediinfo@xyzcorp.com for an automated response for human readable
     information on establishing internet EDI, and
     edisupport@xyzcorp.com for a personal contact.

  b) FTP based messaging

     To exchange EDI messages via FTP, some setup information must be
     included in the trading partner agreement. Typically, an account
     would be created for each trading partner for a FTP login,
     including a password. Typically, each X12 or EDIFACT message
     would be stored in a file, and the trading partner agreement would
     define the conventions for naming files and directories for
     the messages.

     The trading partner agreement would include:
        1. FTP login name and password
        2. Machine(s) from which the login will be accepted
        3. Additional security protocols, e.g. Kerberos[?]
        4. Directory and file naming conventions
        5. File encryption protocols and keys
        6. Wrappers around EDI data, e.g. MIME/EDI headers,
           PEM/PGP wrappers, etc.

  There are several compression routines and utilities available for
  virtually any computer system that uses the Internet. Many of these
  utilities will convert across platforms (say UNIX to Mac, UNIX to PC,
  and vise versa) and are available for free from one of several ftp
  archive servers. Use of these compression routines should be used
  with care when one is employing an encryption technique such as PEM
  or PGP.

5.8. Can the ISA 06 or 08 identify any entity other than the
      'end' Trading Partners (i.e. a routing entity) ?

  Yes, although the ISA06 and ISA08 elements are supposed to be used to
  identify the sender and receiver of the interchange, the receiver of
  the interchange could be a clearinghouse (as well as a VAN) that

processes the interchange and then forwards the data to the ultimate
recipient. In this case, you could put the receiver ID of the
clearinghouse into the ISA08. The clearinghouse would probably have
to determine the ultimate recipient of the message by looking inside
the transaction set (or perhaps by using the GS03). Alternatively,
you could put the receiver ID of the ultimate recipient into the
ISA08 and the clearinghouse would route the interchange based on the
ISA08 value (just as a VAN does).

5.9. Can we specify both the recipient's address and their VAN
      address in the ISA ?

   There was an X12 DM (data maintenance) request proposed to the X12
   standards committee for a change to the ISA segment (X12 header
   information) that would allow users to specify the recipient's VAN,
   in addition to the recipient's ID. The intent was to provide a
   hierarchical address in the ISA. The top level would be the VAN ID,
   and the next level would be the recipient ID. To date, this DM has
   not been approved.

5.10. Are there other options for routing EDI X12 messages ?

   Yes, the GS02 and GS03 data elements can be used for a second level
   of routing. The GS03 is the application receiver's code. Some EDI
   users use the GS03 for routing a functional group to a particular
   department or application within the receiver's corporation. For
   example, you could use the ISA08 to identify the receiver as "Acme
   Corporation" and use the GS03 to identify the receiving application
   as the "Purchasing department (within Acme Corporation)". Many EDI
   users simply put the same value in the ISA06 and the GS02, and put
   the same value in the ISA08 and the GS03. Interestingly, there are
   VANs that will broadcast a message. Other VANs will map the value of
   the ISA08 into a distribution list VAN mailbox ids maintained by the
   VAN. Thus, each recipient receives the exact same copy of the
   interchange and the value of the ISA08 is not changed by the VAN.

6. US Federal Involvement

6.1. What is the commitment of the US Federal Government to EDI ?

   In the Federal Information Processing Standard (FIPS) 161-1 for
   Electronic Data Interchange[2], the US Government committed to using
   EDI X12 and EDIFACT standards in the exchange of business information
   with trading partners already using EDI. On October 26, 1993,
   President Clinton signed an Executive memorandum requiring Federal
   agencies to implement the use of electronic commerce in Federal
   purchases as quickly as possible. As the initial step the
   President's Management Council (PMC) Electronic Commerce Task Force

(ECTF), chaired by the Administrator, Office of Federal Procurement
Policy (OFPP), chartered the Federal Electronic Commerce Acquisition
Team (ECAT) memorandum. The PMC gave ECAT the task of defining the
architecture for the government-wide electronic commerce acquisition
system and identifying the executive departments or agencies
responsible for developing, implementing, operating, and maintaining
the Federal electronic system.

ECAT has become the Federal Electronic Commerce Program Management
Office (ECA-PMO). The National Institute or Science and Technology
(NIST) maintains an HTML home page for the ECA-PMO:

                http://snad.ncsl.nist.gov/dartg/edi/fededi.html

6.2. What is the timetable for the Federal effort ?

To implement EC and to achieve his objectives for EC, the President
set forth the following four milestones:

    1) By March 1994, define the architecture for the
        government-wide EC acquisition system and identify
        executive departments or agencies responsible for
        developing, implementing, operating, and maintaining
        the Federal electronic system. The ECAT identified
        the architecture and recommend actions that each agency
        should take. These documents are available via ftp at
        ds.internic.net in the directory /pub/ecat.library.

                    ftp://ds.internic.net/pub/ecat.library/

    2) By September 1994, establish an initial EC capability
        to enable the Federal government and private suppliers
        to exchange standardized requests for quotations (RFQs),
        quotes, purchase orders, and notice of awards and begin
        government-wide implementation.

    3) By July 1995, implement a full-scale Federal EC system
        that expands initial capabilities to include electronic
        payments, document interchange, and supporting data bases.

    4) By January 1997, complete government-wide implementation
        of EC for appropriate Federal purchases, to the maximum
        extent possible.

6.3. Will the US Government use the Internet to send EDI transactions ?

    According to the ECAT, achieving the following objectives are
    essential for a successful ubiquitous government EDI capability:

     1) E-mail systems may be used as the transport medium for EDI
         transactions.

     2) FTP, FTAM, SMTP, X.400, or X.400 compatible substitutes
         are the preferable transport methods for EDI.

     3) EDI functionality must be supported such that the user can
         choose between the Internet Protocol Suite (IPS) and Open
         Systems Interconnection (OSI) protocol support.

     4) Directory services will be provided through the X.500 model
         as services become available.

     5) Initial implementation of X.400 shall support the user agent
         services defined in P2 and P22 protocols.

     6) By 1996, the X.400 implementations shall contain the
         services defined in the X.435 specification.

     7) The Internet network may be used for EDI transactions when
         it is capable of providing the essential reliability,
         security, and privacy needed for business transactions.

6.4. I heard the US Government prohibited commercial use of the
      Internet?

  The Internet contains many Internet Service Providers (ISPs), each
  with its own internal policies governing the conduct of its
  customers. One of the largest ISPs is the National Science
  Foundation. At one time, NSF adopted what is called the Acceptable
  Use Policy of the National Science Foundation (NSF) was intended to
  prevent commercial uses of the original NSF-sponsored Internet
  telecommunications backbone. However, the growing number of
  commercial providers and backbones now part of the Internet have made
  this policy obsolescent. NSF is currently reducing its direct
  support in favor of subsidies to universities and other NSF sponsored
  organizations. Today the US Government is actively encouraging
  commercial uses of the Internet.

6.5. The US Government is using both Internet and OSI E-mail
      protocols. What should one consider when choosing which to use ?

  For more than a decade, Federal policy has been to promote the Open
  Systems Interconnection (OSI) telecommunications protocols developed
  by international standards bodies. Despite this policy, Government
  agencies, like the private sector, have invested far more in Internet
  than OSI compliant products. Marshall T. Rose's "The Internet
  Message"[3] compares the two alternative protocol suites and finds

clearly in favor of the IPS for messaging in general. For EDI
specifically, the advantages of the IPS are its simplicity, wide
availability, and security provided by Privacy Enhanced Mail (PEM,
see below). IPS lacks a number of desirable features and incurs
something of an efficiency penalty for binary transfers. On the
other hand, the OSI standard for messaging handling service (X.400)
promises a complete solution for EDI; the X.435 protocol includes
responsibility notifications, X.500 directory support, EDI-specific
addressing, message store support, message security, and other EDI-
specific services. Unfortunately, only a handful of X.435 products
have actually reached the market, their interoperability is not
assured, and their prices are substantially greater than for their
IPS counterparts. X.400 addressing tends to lock the customer into
the domain of the service provider, whereas SMTP/MIME addresses are
independent of the provider, permitting the customer to take his/her
business elsewhere relatively easily. The bottom line is that a lot
more organizations do EDI via the Internet than via OSI.

6.6. How is the US Government using VANs to distribute business
      opportunities?

      Presently, VANs make EDI request for quotation (RFQ) transactions
      available to their subscribers (along with other services). For
      example, a VAN client may ask that all RFQs for chairs be forwarded
      immediately to them but the client is not interested in being
      notified about RFQs for paper products. When a VAN sends an RFQ to a
      specific client mailbox, the VAN modifies the "to address" to that of
      the client. In this way, a vendor need only subscribe to a VAN that
      is certified to receive and post the RFQs. The vendor then sees a
      single source for all RFQs of interest, regardless of which buying
      organization originated them. The screening and filtering process
      performed by the VANs prevents the spread of electronic "junk" mail.
      However, a trading partner could use an email filtering program to
      filter and sort email, saving on VAN charges.

6.7. How would use of the Internet for Federal procurement change
      this RFQ process?

      Initially, very few changes may be apparent. New and existing VANs
      will use the Internet to collect and disseminate EDI transactions;
      trading partners may be totally unaware of the change in technology.
      Prices may fall as VANs share telecommunications resources through
      Internet Protocols rather than maintain their own costly proprietary
      telecommunications services. Instead of competing with VANs, the
      ubiquitous connectivity of the Internet offers VANs even greater
      business opportunities. General purpose Internet Service Providers
      (ISPs) do not typically offer EDI specific services, but they can
      provide an alternative means to transfer EDI messages at a small

   fraction of the cost of typical EDI VANs.

   The impact of an organization's moving EDI onto the Internet,
   independent of a VAN, is more difficult to assess. In the view of
   some, the introduction of the Internet in the near term (1-5 years)
   adds additional interfaces and complexity to the organization's
   existing EDI environment. This may in the short term increase costs
   and raise new costs. But a corporate commitment to an open systems
   environment through the use of Internet Protocols offers the
   potential for a greater interoperability, integration of application
   systems, and therefore the promise of higher performance and lower
   costs. Some organizations will be able to get to these benefits
   others will pay for a set of largely incompatible services. The
   return on investment largely depends on one's ability to consider EDI
   on the Internet as a part of the organization's overall information
   systems strategy and the organization's plans for a presence on the
   Internet.

7. EDI Resources On The Internet

7.1. Are EDI Standards available on the Internet ?

   The Data Interchange Standards Association (DISA) has a World Wide
   Web server at "http://www.disa.org/" This Web server has
   considerable information, including a list of new standards, a list
   of all the X12 transaction sets, meeting minutes, calendar of events,
   and lists of courses. Unfortunately, as of this date, the X12
   standards are not available electronically. [soap ...] Hopefully
   that will be added soon. [...soap]. DISA has also set up a gopher
   server (gopher.disa.org) and an FTP server (ftp.disa.org).

   The principle documents regarding ANSI ASC X12's planned alignment
   with EDIFACT are available on the World Wide Web. The alignment plan
   adopted by a mail ballot of X12 in December 1994/January 1995 is at

                http:/www.disa.org/info/alinplan.html

   The "floor motion" adopted at the X12 meeting in February 1995 is at:

                http:/www.disa.org/meetings/alinmotn.html

   The following mail lists and exploders support X12 and EDIFACT
   standards development work.

```
     ------------------
     X12G Mailing list:
     ------------------
```

     This is a fully open exploder set up to support X12G.

     To subscribe send an e-mail message to:

                      x12g-request@snad.ncsl.nist.gov

     The text of the message should only contain the following:

                          subscribe x12g

     After you subscribe, you can broadcast your messages to the
     participants (who have subscribed) via the address

                      x12g@snad.ncsl.nist.gov.

```
     --------------------
     FED-REG Mailing list:
     --------------------
```

     This new exploder is concerned with the federal EDI Registry and
     the implementation of IMPDEF within the registry, the EDI Viewers
     and Editors, and the use of IMPDEF to upgrade EDI products. The
     nature of this mailist calls for informal discussion focusing on
     pragmatic issues.

     To subscribe send an e-mail message to:

                      fed-reg-request@snad.ncsl.nist.gov

     The text of the message should only contain the following:

                          subscribe fed-reg

     Messages intended for the fed-reg list should be sent to:

                      fed-reg@snad.ncsl.nist.gov

```
     -----------------------
     X12C-IMPDEF Mailing list:
     -----------------------
```

     This exploder deals with formal discussion in the context of X12
     regarding the evolution of IMPDEF. If would expect that
     discussions in the context of the "fed-reg" exploder result in

        formal DMRs submitted to "x12c-impdef" and X12C. Anyway, the
        process will be defined and controlled by the appropriate X12C
        authority.

        To subscribe send an e-mail message to:

                    x12c-impdef-request@snad.ncsl.nist.gov

        The text of the message should only contain the following:

                           subscribe x12c-impdef

        Messages intended for the fed-reg list should be sent to:

                        x12c-impdef@snad.ncsl.nist.gov

        See section 7.7 for additional EDI related mailing lists.

7.2. Are EDIFACT Standards available on the Internet ?

    You can access the EDIFACT standards via GOPHER from the
    International Telecommunications Union (gopher://info.itu.ch). Here
    are the general directions in getting to the standards.

            1. Launch the gopher client as gopher info.itu.ch
            2. Select entry 11 (UN and international organizations)
            3. Select entry 1 (UN EDITRANS, UN/EDIFACT (EDICORE))
            4. Select entry 3 (UN-EDIFACT Standards Database (EDICORE))
            5. Select entry 1, Publications.

    If you want the actual standards, select 1, Drafts. You will get

            D93A (which becomes the standard S94a)
            D94A (which will be next year's standard).

    If you want the UNTDED, select 2. If you want the UNTDID, select 3.
    When you get to the lowest level directory in which ever path you
    choose, press D (i.e. upper case D) to download. Choose the protocol
    that suits and you are the proud owner of an EDIFACT Standards
    Directory.

    For electronic mail retrieval, send your message to itudoc@itu.ch
    with no subject and the following message body:

    START
    GET ITU-1900
    END

7.3. The EDI X12 standards are quite complex. How do we decide what
      X12 transactions to implement and how ?

   There are a number of generic implementation conventions (ICs) or
   guidelines; most ICs are prepared on an industry-by-industry basis.
   Be sure that both you and your current trading partners are working
   from the same set. The Federal Electronic Commerce for Acquisition
   Program Management Office has been promoting the 3040 version
   throughout the government and the private sector. Older versions may
   be used in accordance with the ASC X12 rules. Certain ICs are
   published by the Data Interchange Standards Association (DISA);
   contact DISA at the address above for information about ICs for your
   applications. Certain ICs as well as the X12 standards may be
   obtained through:

                    Washington Publishing Company
                    c/o EDI Support Services
                    P.O. Box 203
                    Chardon, OH 44024-0203

                    US Phone   (800) 334-4912
                    Non-US Phone (216) 974-7650
                    Fax   (216) 974-7655

7.4.   What Implementation Conventions (ICs) are available over the
       Internet ?

   The US. Federal Implementation Guidelines for Electronic Commerce for
   Acquisition are available for free via FTP at ds.internic.net. These
   cover X12 transaction sets 810, 820, 824, 836, 838, 840, 843, 850,
   855, 864, and 997. The path is pub/ecat.library/fed.ic/xxx where xxx
   can be acrobat.pdf, postscript or ascii file formats.

            ftp://ds.internic.net/pub/ecat.library/fed.ic/

   The SPEEDE/ExPRESS Project, funded by the National Center for
   Education Statistics of the U.S. Dept. of Ed., publishes an
   Implementation Guide for X12 transaction sets 130, 131, 146, 147, and
   997. The July 1994 versions (each in WordPerfect and in Postscript)
   may be retrieved by anonymous FTP at admissions.carleton.ca. The
   WordPerfect 5.1 files are found in /pub/wp_speede_2 while the
   Postscript files are found in /pub/ps_guide_2.

              ftp://admissions.carleton.ca/pub/wp_speede_2/
               ftp://admissions.carleton.ca/pub/psguide_2/

   Complete directions for retrieving these files can be found in the
   AACRAO gopher at AACRAO-DEC.NCHE.EDU. Choose the SPEEDE/ ExPRESS

menu item, then Publications, and then select a version of the
Implementation Guide. Note that guidelines are sometimes referred to
by the release/version designation (currently 3040).

The Defense Information Systems Agency (DISA) Center for Standards is
the designated configuration manager for DoD Electronic
Commerce/Electronic Data Interchange (EC/EDI) standards. The DoD
EC/EDI Standards repository system, available via anonymous FTP from
ftp.sterling.com in the /edi/DoD-edi/ directory, contains DoD EDI ICs
separated into two categories, User and Test.

                    ftp://ftp.sterling.com/edi/DoD-edi/

Test conventions are identical to User, except that the condition
designator for all applicable transaction sets, data segments and
data elements used by that convention are designated as Mandatory for
test purposes. Implementation convention files, both user and test
versions, can be downloaded either individually or all together in
compressed self-extracting files. All the implementation files are
available, when decompressed, in both WordPerfect 5.1/5.2 (.WP) file
format and Standard Exchange Format (SEF) test files which are for
use with EDISIM software or any other EDI software that conforms with
the EDISIM .SEF file format.

The /DoD-edi/2003_User & _Test directories contain draft DoD
Implementation Conventions based on ANSI X12 Version 2 Release 3
(2003):

     840   Request for Quotation
     843   Response to Request for Quotation
     850   Purchase Order
     997   Functional Acknowledgement

The /DoD-edi/3010_User & _Test directories contain draft DoD
Implementation Conventions based on ANSI X12 Version 3 Release 1
(3010):

     810   Invoice:
     810   Commercial
     810   Progress Payment
     810   Public Voucher
     840   Request for Quotation
     843   Response to Request for Quotation
     850   Purchase Order
     997   Functional Acknowledgement

Additional 2003 and 3010 based conventions may be added in the near
future. 3010 based conventions will never progress to approved

status but will be used temporarily by various DoD agencies to
implement phase I of the DoD Electronic Commerce (EC)/Electronic Data
Interchange (EDI) in Contracting Report.

The /DoD-edi/3050_User directory contains draft DoD Implementation
Conventions based on ANSI X12 Version 3 Release 5 (3050):

        840   Request for Quotation
        843   Response to Request for Quotation
        850   Purchase Order
        855   Purchase Order Acknowledgement
        860   Purchase Order Change Request - Buyer Initiated
        865   Purchase Order Change Acknowledgement/Request - Seller
              Initiated

Note that the ICs in the /DoD-edi/3050_USER directory were developed
as a means to express DOD requirements for an ANSI X12 3050 based
transaction set. They are not approved for implementation. They
have been submitted to the Federal IC configuration management
process for adoption throughout the federal government. Since they
are subject to Federal review and are based upon a standard not yet
released, changes can be anticipated. (See ECA PMO above)

7.5 How can a trading partner keep up with all these implementation
     conventions (ICs) and revisions in X12 and EDIFACT?

The US government is trying to standardize electronic communications
internally and with it's 300,000 plus suppliers. This requires
standardization of the standards process and cross communication
between programs. The IMPDEF message and the NIST Federal IC
Registry will place electronic versions of all its ICs on the
Registry - both full federal ICs and individual agency ICs - so that
any trading partner can download and use them. In combination with
message data compliance checking as well, smaller firms should be
able to get into EDI and start benefitting both themselves and the
government.

7.6. Where can I get information on EDI translation software ?

Several commercial trade magazines publish periodic guides to EDI
translation software. Under commission by the US Government, the
Logistics Management Institute (LMI) of McLean, Va. published "A
Guide to EDI Translation Software, 1994 Edition." The guide
describes the features and characteristics of EDI software offered by
more than 60 vendors. Commercial organizations can get copies for
$20 each by sending a check made out to the Logistics Management
nstitute. Federal agencies may have up to five free copies by
sending requests to

                    Logistics Management Institute
                    Attn. Library
                    2000 Corporate Ridge
                    McLean, Virginia, 22102-7805

   You can fax a typed request to the LMI library at (703) 917-7597 or
   send a request to library@lmi.org. Requests for hard copies of the
   Guide must include the requester's name, organization, address,
   telephone number, and number of copies desired. All requests should
   cite Report IR421RD1. If you have questions about the Guide, you can
   contact the author, Harold Frohman, at (703) 917-7286 or send him an
   Internet message at hfrohman@lmi.org.   A somewhat older LMI report
   (1992), but still quite relevant, is EDI Planning and Implementation
   Guide (DL204RD1, August 1992).

7.7. How do I keep in touch with others pursuing EDI and Electronic
      Commerce on the Internet ?

   There are several EDI related mailing lists on (and off) the
   Internet. Information on subscription follows below.

   IETF-EDI Mailing list:

      The IETF-EDI list has been established as a forum for discussing
      methods of operating EDI transactions over the Internet, and for
      discussing specifications which permit such operation. This list
      is therefore focused on the technology of Internet usage of EDI,
      rather than on more general aspects of EDI technology or use.

      To subscribe, send an e-mail message to:

                        LISTSERV@BYU.EDU.

      The text of the message should only contain the following:

                        sub ietf-edi <your-name>

      Messages intended for the ietf-edi list should be sent to:

                        IETF-EDI@BYU.EDU.

```
   -------------------
   EDI-L Mailing list:
   -------------------
```

   The EDI-L list is target towards more general EDI discussions.
   The edi-l mailing list is also gatewayed to the USENET newsgroup
   bit.listserv.edi-l.

   To subscribe, send an e-mail message to:

                        listserv@uccvma.ucop.edu

   The text of the message should only contain the following:

                        subscribe edi-l <your-name>

   Messages intended for the edi-l list should be sent to:

                        EDI-l@uccvma.ucop.edu


```
   ---------------------
   EDI-NEW Mailing list:
   ---------------------
```

   This list complements ietf-edi in the sense that it promotes
   discussion of new approaches to edi and the extension of edi
   beyond its traditional domains.

   To subscribe, send an e-mail message to:

                     edi-new-request@tegsun.harvard.edu

   The text of the message should only contain the following:

                        subscribe edi-new <your-name>

   Messages intended for the edi-new list should be sent to:

                        edi-new@tegsun.harvard.edu

```
     --------------------
     SPEEDE-L Mailing list:
     --------------------
```

The main purpose of this list is for discussions of Educational
EDI Standards.

To subscribe, send an e-mail message to:

                    listserv@vtvm1.cc.vt.edu

The text of the message should only contain the following:

               SUBSCRIBE SPEEDE-L firstname lastname

Messages intended for the speede-l list should be sent to:

                    speede-l@vtvm1.cc.vt.edu

```
     ---------------------
     OPEN-EDI Mailing list:
     ---------------------
```

The main purpose of this list is for UN/EDIFACT users to review
the work of JTC1/SC30.

To subscribe, send an e-mail message to:

                    majordomo@utu.premenos.com

The text of the message should only contain the following:

                       subscribe open-edi

Messages intended for the open-edi list should be sent to:

                    OPEN-EDI@utu.premenos.com

```
     ------------------
     ECAT Mailing list:
     ------------------
```

The Federal Electronic Commerce for Acquisition Team (ECAT) has
established an open mail list for those interested in ECAT
activities.

Information sent to the forum address is automatically distributed
to all forum members. This forum is available 24 hours a day, 7
days a week. Currently, only ASCII text messages up to 250kb are
supported. For best results when sending messages to this forum,
each line should be limited 70 characters followed by a carriage
return. Also, your name and email address should be included in
the body of messages sent.

To subscribe, send an e-mail message to:

                    listserv@forums.fed.gov

The text of the message should only contain the following:

                    subscribe ecat firstname lastname

Messages intended for the ECAT list should be sent to:

                    ECAT@forums.fed.gov.

7.8. Can I get messages that have been previously posted to the EDI
      mailing lists ?

   Yes. Messages that have appeared on the ecat, edi-l, edi-new, fed-
   reg, x12c-impdef and ietf-edi list are available via FTP from

                    ftp://ftp.sterling.com/edi/lists/

7.9. I have EDI related material I'd like to make available to the
      Internet community. How do I do that ?

   If you have an existing Internet connected site, you can make the
   information available via FTP or WWW. If you do not wish to go to
   the effort, send mail to Kent Landfield at

                    edi-archive@sterling.com

   Sterling Software is making the archive publicly available to the
   community. Anyone who wants to distribute EDI related documents may
   contact Sterling to make your documents publicly available on
   ftp.sterling.com. For example, the Department of Veterans Affairs
   has posted numerous studies and training materials on EDI which are
   available to the public at ftp.sterling.com/edi/va/.

7.10. Where are EDI Archives on the Internet ?

   Some have been discussed previously while others have not. Here is a
   very incomplete list of sites that archive EDI related material and

make that information publicly available.

        o ftp://admissions.carleton.ca/pub/
        o ftp://ds.internic.net/ietf/edi/
        o ftp://ds.internic.net/pub/ecat.library/
        o ftp://ftp.sterling.com/edi/
        o ftp://ftp.swin.edu.au/pub/edi/
        o ftp://prospero.isi.edu/pub/papers/security/
        o ftp://turiel.cs.mu.oz.au/pub/edi/

        o http://snad.ncsl.nist.gov/dartg/edi/fededi.html
        o http://waltz.ncsl.nist.gov/ECIF/ecif.html
        o http://www.disa.org/
        o http://www.acq.osd.mil/ec/
        o http://www.ietf.cnri.reston.va.us/
        o http://www.premenos.com/standards/EDIStandards.html

8. Security Considerations

8.1. What security measures are needed to connect to the Internet ?

   Internet security measures can be placed in two broad categories:
   protecting your system from intruders and protecting the content and
   integrity of your messages. With respect to the latter, EC/EDI
   transactions of nominal value and sensitivity do not require special
   security requirements. However, if the information has any sensitive
   aspects, you will need to take measures discussed below. Competitors
   might intercept your bids and undercut your proposal. Or they could
   monitor your purchases and shipping notices to determine your firm's
   production capacity. To ensure confidentiality of the message, your
   e-mail system should offer some means of encrypting the message in a
   manner only the intended recipient can read. Trading partners are
   responsible for satisfying existing rules and regulations relating to
   computer security and privacy. For example, bid data received by
   government systems is subject to the appropriate controls. Trading
   partner financial account data is likewise subject to disclosure
   restrictions. To thwart those who might tamper with a message to
   divert delivery by changing the "ship-to" address, digital signatures
   can attest to the integrity of the message. Digital signatures can
   also authenticate messages, preventing pranksters or rivals from
   submitting false orders.

8.2. How do we go about protecting our system ?

   The weakest link in most systems are people and passwords; your
   current practices for managing both will apply to use of the
   Internet. Steps you can take include:

    o Obtain, study, implement, and enforce the NIST FIPS (112) on
       passwords. Make the practice of safe computing a condition of
       continued employment and let your staff know it.

    o Conduct a risk assessment as described in Appendix M of the
       Federal Electronic Commerce for Acquisition Team report
       Streamlining Procurement Through Electronic Commerce. This
       documents is available via ftp at ds.internic.net in the
       directory /pub/ecat.library.

    o Apply the recommendations from NIST Special Publication 800-9,
       Good Security Practices for Electronic Commerce, Including
       Electronic Data Interchange as appropriate.

    o Establish necessary internal and external "Firewalls." See
       John Wack and Lisa Carnahan, "Keeping Your Site Comfortably
       Secure: An Introduction to Internet Firewalls," NIST Special
       Publication 800-10, undated.

    o Review RFC 1281[4] Guidelines for the Secure Operation of
       the Internet and RFC 1244 Holbrook and Reynolds "Site Security
       Handbook"

    o Review Cheswick and Bellovin's "Firewalls and Internet
       Security - Repelling the Wily Hacker," Addison-Wesley [5]

    o Consider implementing active countermeasures in your firewalls.
       See "There Be Dragons" by S. Bellovin, Proceedings of the Third
       Usenix UNIX Security Symposium, September 1992[6]. You can
       contact Bellovin at smb@ulysses.att.com.

8.3. Is there good publicly available software I can use?

   These are several free, publicly available, security tools one can
   obtain via ftp from one of many good archives. If your company uses
   UNIX systems to connect to the Internet or has UNIX systems connected
   to the Internet get and use the following tools:

    1. The Purdue University COAST - Security Archive (Computer
        Operations, Audit, and Security Tools, run by Gene Spafford)
        is located at coast.cs.purdue.edu and mirrored in a few places,
        including ftp.sterling.com.
    2. COPS available from ftp.cert.org in /pub/tools
    3. TIGER available from net.tamu.edu in pub/

   These tools are a series of scripts and programs that will alert you
   to many well-know problems and holes in UNIX systems and how to fix
   them.

   The Computer Emergency Response Team (CERT) at Carnegie Mellon
   University can assist with computer break-ins as well as provide
   notices of security activity on the Internet. The US Department of
   Energy's Computer Incident Advisory Capability (CIAC), located at
   Lawrence Livermore National Laboratory, can provide assistance at
   ciac@llnl.gov or at 510-422-8193. CIAC offers software and documents
   on their anonymous ftp server at ciac.llnl.gov. Both CERT and CIAC
   are members of the Forum of Incident Response and Security Teams
   (FIRST), a global organization to foster cooperation and coordination
   among computer security teams worldwide.

8.4. How good are electronic or digital signatures ? Can they be used
      in court ?

   Properly used, these signature systems are better than existing paper
   based authentication and forgery detection technology. You will find
   a clear and concise description of how these signatures work in Gary
   Ratterree's RIPEM Beginner's Guide; contact Ratterree at
   grayr@cs.tamu.edu.   Other references include:

                 ftp://ftp.tis.com/pub/PEM/   for Privacy Enhanced Mail
                 ftp://ftp.rsa.com/   for PEM
                 ftp net-dist.mit.edu:/pub/PGP for Pretty Good Privacy
                                               (PGP)

   An "infrastructure" for public keys is not required to use public key
   encryption or digital signatures. In the absence of such an
   infrastructure, the encryption protocol and the public keys would
   need to be exchanged bilaterally, such as part of the trading partner
   agreement. A public key infrastructure would provide a secure means
   to obtain a public key without a need for a manual key exchange.

   But digital techniques will become more convenient with the arrival
   of additional infrastructure and support systems. The US government
   is taking steps to ensure the admissibility in court of such systems.
   We anticipate that the necessary regulatory and legal infrastructure
   will be in place about the same time as the necessary directory and
   certificate services and other supporting systems come on-line. We
   expect to see expansion of several government pilot programs in the
   later half of 1994. NIST recently published a report on the Public
   Key Infrastructure (PKI) and related policy issues; for information
   contact the NIST Computer Security Division at 301-975-2934.

8.5. Are there other US government standards publications I should
      be aware of?

   Yes. Here is a sample of those you will often hear mentioned.

   1. Federal Information Processing Standard (FIPS) Publication
      46-1, Data Encryption Standard, January 1988.

   2. FIPS Publication 65, Guideline for Automated Data Processing
      Risk Analysis, August 1979.

   3. FIPS Publication 113, Computer Data Authentication, May 1985.

   4. FIPS Publication 180, Secure Hash Standard - (SHS), May 1993.

   5. FIPS Publication 186, Digital Signature Standard - (DSS),
      May 1994.

   6. NIST Special Publication 800-9, Good Security Practices for
      Electronic Commerce Including Electronic Data Interchange,
      December 1993.

   The FIPS standards may be ordered from the

            U.S. Department of Commerce
            National Technical Information Service
            Springfield, VA 22161.

9. References

   [1] UN/EDIFACT (Electronic Data Interchange for Administration,
       Commerce and Transport) Syntax Rules (ISO 9735), March 1993,
       United Nations Economic Commission for Europe (UN/ECE), Working
       Party for the Facilitation of International Trade Procedures
       (WP.4)

   [2] FIPS Publication 161-1, Electronic Data Interchange (EDI),
       National Institute of Standards and Technology, April 1993.

   [3] The Internet Message: Closing the book with electronic mail,
       Marshal T. Rose., Prentice Hall, Englewood Cliffs, New Jersey,
       1993.

   [4] Pethia, R., Crocker, S., and B. Fraser, "Guidelines for the
       Secure Operation of the Internet", RFC 1281, Software
       Engineering Institute, Trusted Information Systems, Inc.,
       Software Engineering Institute, November 1991

   [5] Firewalls and Internet Security - Repelling the Wily Hacker,
       by Cheswick and Bellovin, Addison-Wesley, 1994,
       ISBN 0-201-63357-4

   [6] There Be Dragons, S. Bellovin, Proceedings of the Third
       Usenix UNIX Security Symposium, Baltimore, Maryland, September
       1992. USENIX Association, ISBN 1-880446-46-4

10. Credits

   James A.(Artch) Griffin <artch@AGRIFFIN.CPCUG.ORG> is credited with
   co-authorship as he prepared the ECAT FAQ which I used (or perhaps
   abused) as the base document. Artch was judicious and patient as he
   watched his original text being rewritten over and over.

   Carl Hage contributed detailed explanations and clarifications of the
   various Internet protocols and services and how EDI can employ them.

   I would like to thank the following people for their comments and
   specific contributions: Kent Landfield, Mike Bauer, Kit Lueder, Eric
   Christ, Betsy Bainbridge, Bob Lyons, Kirby Spencer, Sally Hambridge,
   Ed Levinson, Warren Smith, Steve Bass, Jerry Johnson, Randy
   VandenBrink, John Pillay, Jim W.C. Smith, Mark Charles, Jean-
   Philippe Favreau. I apologize if I omitted any one of the many folks
   who responded to my many calls for comments.

   I greatly appreciate Kent Landfield for his editorial assistance
   during final preparation of this document. Sterling Software
   graciously hosted the work in progress for ftp access and review,
   saving many bits of Internet SMTP traffic.

   Finally, I am grateful for the patient cooperation of the IETF
   Working Group and the participants of the IETF-EDI and EDI-L lists.
   It's a nice cyberplace to work!

       WRH, Washington, DC.

11. Authors' Addresses

    Walter Houser
    Department of Veterans Affairs
    810 Vermont Avenue
    Washington DC, 20240

    Phone: 202-786-9572
    EMail: houser.walt@forum.va.gov
           houser@cpcug.org
    http://www.va.gov/

    James A. (Artch) Griffin
    President, Athena Associates
    18924 High Point Drive
    Gaithersburg, Maryland 20879

    Phone: 301-972-2502
    EMail: agriffin@cpcug.org

    Carl Hage
    C. Hage Associates
    1180 Reed Ave #51
    Sunnyvale, CA 94086

    EMail: carl@chage.com
    http://www.chage.com/chage/