Discussion Paper

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Title: X12 Guideline, Entry Level, Asynchronous Transmissions

This paper supersedes document ANSI/ASC/X12C/85-025. The changes found are based on inputs from a meeting on November 20, 1985 (Sub-committee C's, Task Group 1, Asynchronous Guidelines).

Purpose

This document describes in detail the communication parameters of an asynchronous transmission between two parties using the ANSI X12 standard for business transactions. This guideline addresses the needs of the small business user. Thus it was designed with small data volumes in mind (less than 100K bytes per transmission). The technology required to implement this guideline needs to be both widely available and inexpensive.

Layers

Using the OSI seven layer model as a general reference point, this guideline presents the communication parameters in two parts; the technical parameters, layers 1 thru 4 of the OSI model, and the management parameters, layers 5 thru 7. This allows this communication guide to specify what parameter is required without specifying how a parameter is implemented.

1.0 Communication Layers

- Connection: two wire Public Switched Telephone Network (PSTN).

- Modem: Bell 212A compatible (1200 bps). Note: higher line speeds can be utilized. The receiver's modem must be able to automatically adjust downward when the sender is using a Bell 212A compatible modem. The sender's higher speed modem must assume the receiver's modem is Bell 212A-like if no prior knowledge is available.

- Error correction protocol.

  The four protocols under consideration are;

o Blast
o MNP
o XMODEM
o X.PC

and the criteria on which each will be judged follow.

- Reliability is a must. A sixteen bit cyclic redundancy check (CRC) error detection is required. That is, 99.955% of all errors of 16 bits or less will be detected.

There is a possibility that an error can occur between the modem and the computer's secondary storage (disc). This type of error is likely in today's multitasking computers. For example, the computer may not be listening to the data communication port, but instead doing something else like accepting input from another communication port.

- Protocol must be in the public domain.

- Desirable characteristics;

  x Commercially available in PC data communication software packages.

  x Cost of PC packages less than $500.

  x Found across a wide variety of computers; not just PCs, but minis and mainframes.

  x Flow control.

  x Able to piggy-back on a X.25 network.

  x Full-duplex.

  x Selective re-transmission.

    Selective re-transmissions means when a block is found to be in error, then only that block needs to be resent. Many protocols require the sender to re-send the block in error and all other blocks after.

  x Transparency of binary data.

    Transparency of binary data means that data frames should not contain a bit pattern that could be interpreted as a control character by an asynchronous device (such as a CNTRL Q). This is important because the upper layers may allow encryption or compaction of ANSI X12 data.

2.0 Management Layers

- The sender makes the call.

- The first characters sent down the communication circuit are the ANSI X12 ISA segment or in the case where the sender is looking for sent X12 data and has nothing to send at this time the following message is sent:

  "NO ANSI X12 DATA TO SEND. ...up to 80 bytes..."

- The sender continues transmitting ANSI X12 data.

- The receiver must either transmit an ANSI X12 data stream or a message stating there is no data to send.

  "NO ANSI X12 DATA TO SEND. ...up to 80 bytes..."

- End of session.

- Receivers must be able to accept phone calls during 8 am - 5 pm, local time, 95% of the time at a minimum.

- The ASCII code set.

- Both the sender and receiver need to be able to answer questions about their sessions for a minimum of 20 business days. (e.g. Who sent what to whom and when?)

- Interchange acknowledgments are required. Exception: if an interchange envelope (ISA..IEA) contains only acknowledgment segments (TA1), then the receiver does not acknowledge an acknowledgment. This avoids an endless loop.

- Anything not stated cannot be used without special arrangements between two parties (e.g. checkpoint/restarts, encryption, compaction, or message authenication).

Note

The major issue for the final guideline is the selection of an error correction protocol.