TELNET BINARY TRANSMISSION

This RFC specifies a standard for the ARPA Internet community. Hosts on
the ARPA Internet are expected to adopt and implement this standard.

1. Command Name and Code

   TRANSMIT-BINARY   0

2. Command Meanings

   IAC WILL TRANSMIT-BINARY

      The sender of this command REQUESTS permission to begin
      transmitting, or confirms that it will now begin transmitting
      characters which are to be interpreted as 8 bits of binary data by
      the receiver of the data.

   IAC WON'T TRANSMIT-BINARY

      If the connection is already being operated in binary transmission
      mode, the sender of this command DEMANDS to begin transmitting
      data characters which are to be interpreted as standard NVT ASCII
      characters by the receiver of the data. If the connection is not
      already being operated in binary transmission mode, the sender of
      this command REFUSES to begin transmitting characters which are to
      be interpreted as binary characters by the receiver of the data
      (i.e., the sender of the data demands to continue transmitting
      characters in its present mode).

      A connection is being operated in binary transmission mode only
      when one party has requested it and the other has acknowledged it.

   IAC DO TRANSMIT-BINARY

      The sender of this command REQUESTS that the sender of the data
      start transmitting, or confirms that the sender of data is
      expected to transmit, characters which are to be interpreted as 8
      bits of binary data (i.e., by the party sending this command).

   IAC DON'T TRANSMIT-BINARY

      If the connection is already being operated in binary transmission
      mode, the sender of this command DEMANDS that the sender of the
      data start transmitting characters which are to be interpreted as

standard NVT ASCII characters by the receiver of the data (i.e.,
the party sending this command). If the connection is not already
being operated in binary transmission mode, the sender of this
command DEMANDS that the sender of data continue transmitting
characters which are to be interpreted in the present mode.

A connection is being operated in binary transmission mode only
when one party has requested it and the other has acknowledged it.

3. Default

WON'T TRANSMIT-BINARY

DON'T TRANSMIT-BINARY

The connection is not operated in binary mode.

4. Motivation for the Option

It is sometimes useful to have available a binary transmission path
within TELNET without having to utilize one of the more efficient,
higher level protocols providing binary transmission (such as the
File Transfer Protocol). The use of the IAC prefix within the basic
TELNET protocol provides the option of binary transmission in a
natural way, requiring only the addition of a mechanism by which the
parties involved can agree to INTERPRET the characters transmitted
over a TELNET connection as binary data.

5. Description of the Option

With the binary transmission option in effect, the receiver should
interpret characters received from the transmitter which are not
preceded with IAC as 8 bit binary data, with the exception of IAC
followed by IAC which stands for the 8 bit binary data with the
decimal value 255. IAC followed by an effective TELNET command (plus
any additional characters required to complete the command) is still
the command even with the binary transmission option in effect. IAC
followed by a character which is not a defined TELNET command has the
same meaning as IAC followed by NOP, although an IAC followed by an
undefined command should not normally be sent in this mode.

6. Implementation Suggestions

It is foreseen that implementations of the binary transmission option
will choose to refuse some other options (such as the EBCDIC
transmission option) while the binary transmission option is in

effect. However, if a pair of hosts can understand being in binary
transmission mode simultaneous with being in, for example, echo mode,
then it is all right if they negotiate that combination.

It should be mentioned that the meanings of WON'T and DON'T are
dependent upon whether the connection is presently being operated in
binary mode or not. Consider a connection operating in, say, EBCDIC
mode which involves a system which has chosen not to implement any
knowledge of the binary command. If this system were to receive a DO
TRANSMIT-BINARY, it would not recognize the TRANSMIT-BINARY option
and therefore would return a WON'T TRANSMIT-BINARY. If the default
for the WON'T TRANSMIT-BINARY were always NVT ASCII, the sender of
the DO TRANSMIT-BINARY would expect the recipient to have switched to
NVT ASCII, whereas the receiver of the DO TRANSMIT-BINARY would not
make this interpretation.

Thus, we have the rule that when a connection is not presently
operating in binary mode, the default (i.e., the interpretation of
WON'T and DON'T) is to continue operating in the current mode,
whether that is NVT ASCII, EBCDIC, or some other mode. This rule,
however, is not applied once a connection is operating in a binary
mode (as agreed to by both ends); this would require each end of the
connection to maintain a stack, containing all of the encoding-method
transitions which had previously occurred on the connection, in order
to properly interpret a WON'T or DON'T. Thus, a WON'T or DON'T
received after the connection is operating in binary mode causes the
encoding method to revert to NVT ASCII.

It should be remembered that a TELNET connection is a two way
communication channel. The binary transmission mode must be
negotiated separately for each direction of data flow, if that is
desired.

Implementation of the binary transmission option, as is the case with
implementations of all other TELNET options, must follow the loop
preventing rules given in the General Considerations section of the
TELNET Protocol Specification.

Consider now some issues of binary transmission both to and from
both a process and a terminal:

   a. Binary transmission from a terminal.

      The implementer of the binary transmission option should
      consider how (or whether) a terminal transmitting over a TELNET
      connection with binary transmission in effect is allowed to
      generate all eight bit characters, ignoring parity
      considerations, etc., on input from the terminal.

   b. Binary transmission to a process.

      The implementer of the binary transmission option should
      consider how (or whether) all characters are passed to a
      process receiving over a connection with binary transmission in
      effect. As an example of the possible problem, TOPS-20
      intercepts certain characters (e.g., ETX, the terminal
      control-C) at monitor level and does not pass them to the
      process.

   c. Binary transmission from a process.

      The implementer of the binary transmission option should
      consider how (or whether) a process transmitting over a
      connection with binary transmission in effect is allowed to
      send all eight bit characters with no characters intercepted by
      the monitor and changed to other characters. An example of
      such a conversion may be found in the TOPS-20 system where
      certain non-printing characters are normally converted to a
      Circumflex (up-arrow) followed by a printing character.

   d. Binary transmission to a terminal.

      The implementer of the binary transmission option should
      consider how (or whether) all characters received over a
      connection with binary transmission in effect are sent to a
      local terminal. At issue may be the addition of timing
      characters normally inserted locally, parity calculations, and
      any normal code conversion.