"VERY DISTANT" HOST INTERFACE

The normal method of connecting a Host computer to the ARPA
Network is, and will continue to be, placing an IMP at the Host
site and making a short-distance hard-wire connection. However,
during the past several months we have become increasingly aware
of the occasional desire to interface a Host to some IMP via a
long-distance connection (where long-distance, in this context,
is any cable run longer than 2000 feet but may typically be tens
of miles) via either a hard-wire or telephone circuit. We believe
that any good solution to the general problem of interfacing Hosts
to IMPs must satisfy at least the following criteria:

    1) The characteristics of the connection should be such
        that the undetected error rate can be expected to be
        extremely low.

    2) The bandwidth of the connection should not be
        intrinsically limited to a low value.

    3) The nature of the connection should be such that the
        Host may establish multiple network "conversations",
        i.e., it should have all the power of a normal Host
        connection.

These criteria were briefly discussed in our earlier RFC #241
(NIC #7671), "Connecting Computers to MLC Ports."

    After a careful review of the various possibilities for "very
distant" Host connection, we have arrived at a preliminary design
for this type of interface which we believe should prove
satisfactory with regard to the criteria above. Although
detailed specifications will not be available for some time, the
basic elements of the design are as follows:

Transmissions will be full-duplex and will use the same
Binary Synchronous format that is presently used in inter-IMP
communication. At the IMP end, a hardware interface identical
in type, but not necessarily in speed, to the usual IMP 50 kilobit
modem interface will be used. This interface frames blocks of
outgoing data with special characters and appends a 24 bit cyclic
redundancy check (CRC). It de-frames and checks incoming blocks
which must be of similar format. The Host must provide mating
formatting, de-formatting and checking facilities at its end.

        In conjunction with the CRC creation and checking, the IMP
will be provided with a small amount of "retransmission" software
as a front (i.e., Host side) end for the usual Host/IMP interface
software. The retransmission scheme, although not presently
completely defined, will be based on positive acknowledgment/
timeout techniques.

        The Host will be required to provide a front (i.e. IMP side)
end to its NCP which can generate CRCs and test for CRC errors,
provide simple retransmission logic, etc. This front end may be
implemented in Host software, by means of special purpose hardware,
in a minicomputer, or in any other way which the Host organization
finds reasonable.

        This new type of interface will be completely documented,
from both a hardware and software point of view, as soon as the
detailed design is completed. This documentation will probably
take the form of an update to BBN report No. 1822.

        We will be happy to discuss this type of interface with any
interested organization, although it should be remembered that
detailed design is not yet completed.

AMcK:jm

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