APPENDIX A : G.DELOCHE- TERM PAPER

Network Working Group
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Request for Comment: 7 University of California at Los Angeles
NIC: 4693
May 1969

Host-Imp Interface

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Object: Arpa Network - Specification Outlines for Host-IMP (HI)
Interface Programs.

Outline

I. Introduction

II. Scope of the software organization.
II-1 Network program
II-2 Handler program

III. Questions

[The original of RFC 7 was hand-written, and only partially illegible

copies exist. RFC 7 was later typed int NLS by the Augmentation
Research Center (ARC) at SRI. The following is the best reconstruction we could do. RFC Editor.]

I. Introduction

This paper is concerned with the preliminary software design of the
Host IMP interface. Its main purpose is on the one hand to define
functions that will be implemented, and on the other hand to provide
a base for discussions and ...(unreadable).

This study is based upon a study of the BBN Report No. 763.

II. Scope of the software organization.

The system is based upon two main programs: the Handler program that
drives the channel hardware unit, and the Network program which
carries out the user's transmission requests.

As the communication is full duplex, each of these programs can be

viewed as divided into two parts: one is concerned with the output data, the other with the input. (See Fig. 1)

These two programs exchange data through a pool of buffers, and logical information through an interface table.

In the following we only focus on the output part of each program (See Fig. 2). The input part would be very similar.

II-1. Network program.

II-1-1. Multiplex function.

This program multiplexes the outgoing messages (and distributes the incoming messages). The multiplexing consists in stacking up all the user's (or caller, or party) requests and filling up the pool of buffers so as to keep the handler busy emitting.

Multiplexing (and distribution) is based on the link identification numbers. (Link = logical connection between two users). The multiplexing problem is closely related to the interface between a user's program and the network program, that is in fact...(unreadable) operating system (See below: Questions).

II-1-2. Output message processing.

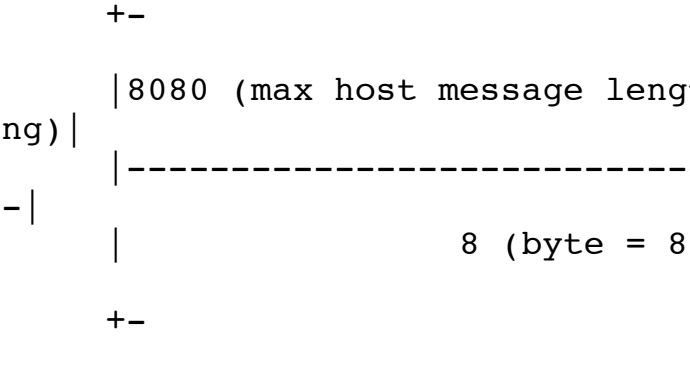
When a user's program wants to send out text it should indicate the following information (through a macro, or as call parameters): text location, text length in bytes, and destination.

Using these data the Network program:

* prepares a 16 bit Host heading (1 bit: trace, 2 bits: spares, 8 bits: link identification no., 5 bits: destination host)

* inserts a 16 bits marking between the header and the text so as to start the text at a word boundary. This marking consists of a one preceding the first bit of the text and, in turn, preceded by fifteen zeros to fill up the gap.

* checks the length of the user's text - if it exceeds 1006 bytes



the program breaks down the text into a sequence of messages whose maximum length is 1006 bytes - Each of these messages is preceded by a heading as explained above.

Remark: in that case one of the heading space bits could

be used for
indicating that several messages belong to the same text.

* _transcodes_ the EBCDIC characters constituting the messages
into ASCII characters.

* _fills_ the buffers of the pool with the content of the
messages.

* _updates_ the content of the interface table and moves the
filling pointers (see below).

II-2. Handler program.

This program is initiated either by the network program, or by the
I/O interrupt.

This program will be very short. It will be coded in master mode
(privileged instructions) and should be integrated in the I/O
supervisor of the operating system.

This program:

* _controls_ the channel hardware unit. It initiates

the
emission, eventually provides data chaining between
the
buffers, tests the different device status upon
receiving an
interrupt.

* _empties_ the buffers that are filled up by the
network
program.

* _explores_ and _updates_ the interface table (see
below).

* can eventually insure a control transmission
procedure with the
IMP (See Questions).

II-3 Buffers and Interface Table.

II-3-1 Buffers.

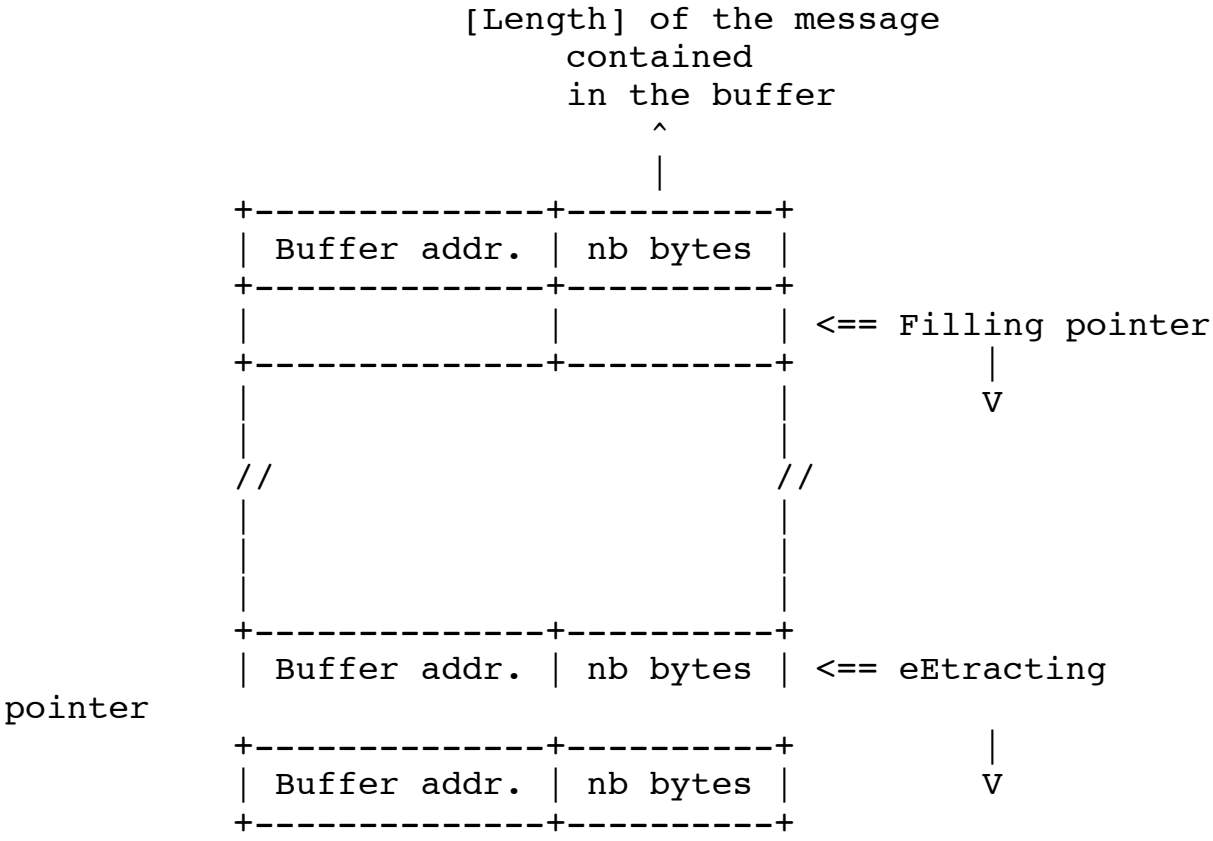
They should be large enough for containing the maximum
host message
text + heading and marking (1006 + 4 = 1010 bytes).

Consequently the buffer size could be chosen equal to 256
words (1024
bytes). As for the buffer number it will determine the
link
utilization frequency -

II-3-2 Interface table.

It is through this table that the network program informs
the handler
with the location and length of the emitting data.

This table could be a ring table with 2 pointers: one for
filling,
the other for extracting. They are respectively updated
by the
network and the handler program.


[Length] of the message
contained
in the buffer
Buffer addr.
nb bytes
<== Filling pointer
Buffer addr.
nb bytes
<== eEtracting
pointer
Buffer addr.
nb bytes

III. Questions.

III-1. Why is there not a simple control procedure between the HOST and
the IMP? What happens if a message, issued from the HOST,
reaches the IMP with an error due to the transmission?

From the BBN specifications it appears that this error will be
transmitted as far [as] the receiving HOST.

In that case must an HOST-HOST control procedure be provided?

III-2. Where will the special channel hardware unit be connected
(MIOP/SIOP)?

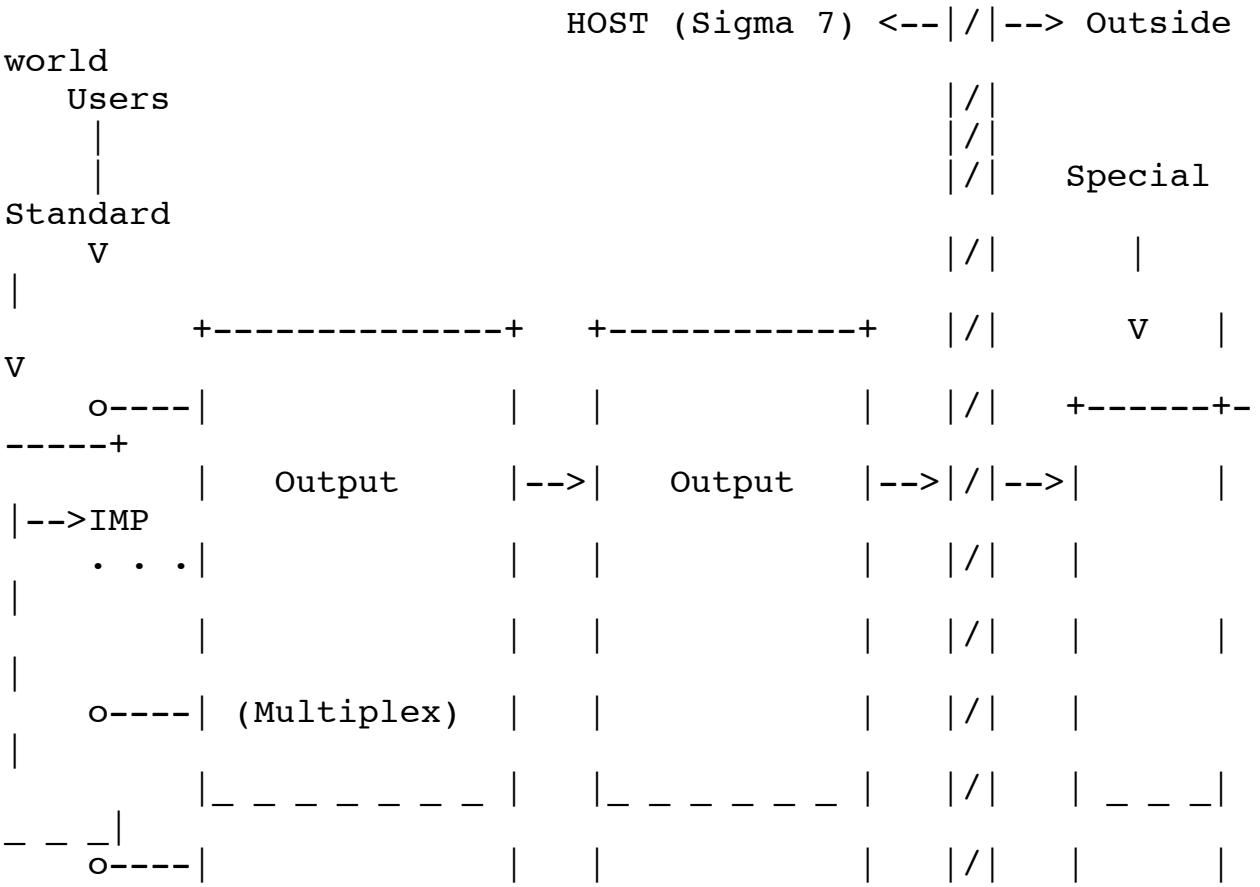
How will this device be notified of an outgoing message end in order
to start the padding?

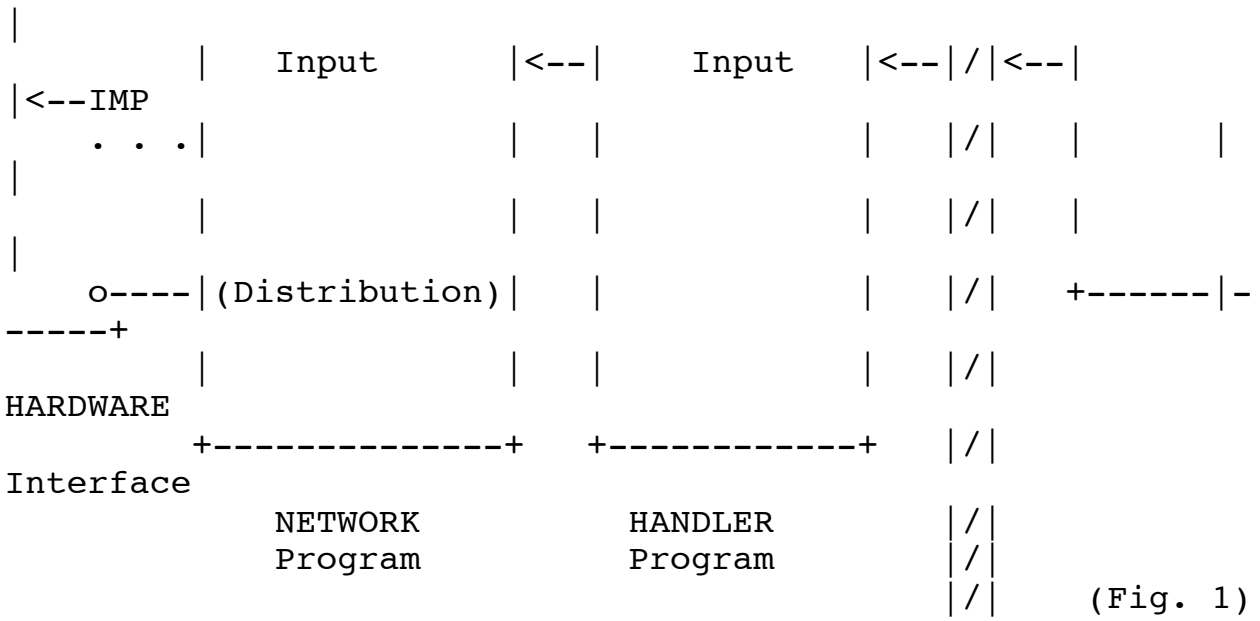
(The program will provide to the MIOP SIOP the number of bytes of the
outgoing message, and will receive back an interrupt when the last
byte is sent out. Is it that signal which will be also sent to the
special device?)

Vice versa how does the Handler know the length of the incoming
message? From the contents of the previous one or should this

program always ready to receive a message of maximum length? (Then
an interrupt should be triggered when the real end is detected by the
hardware).

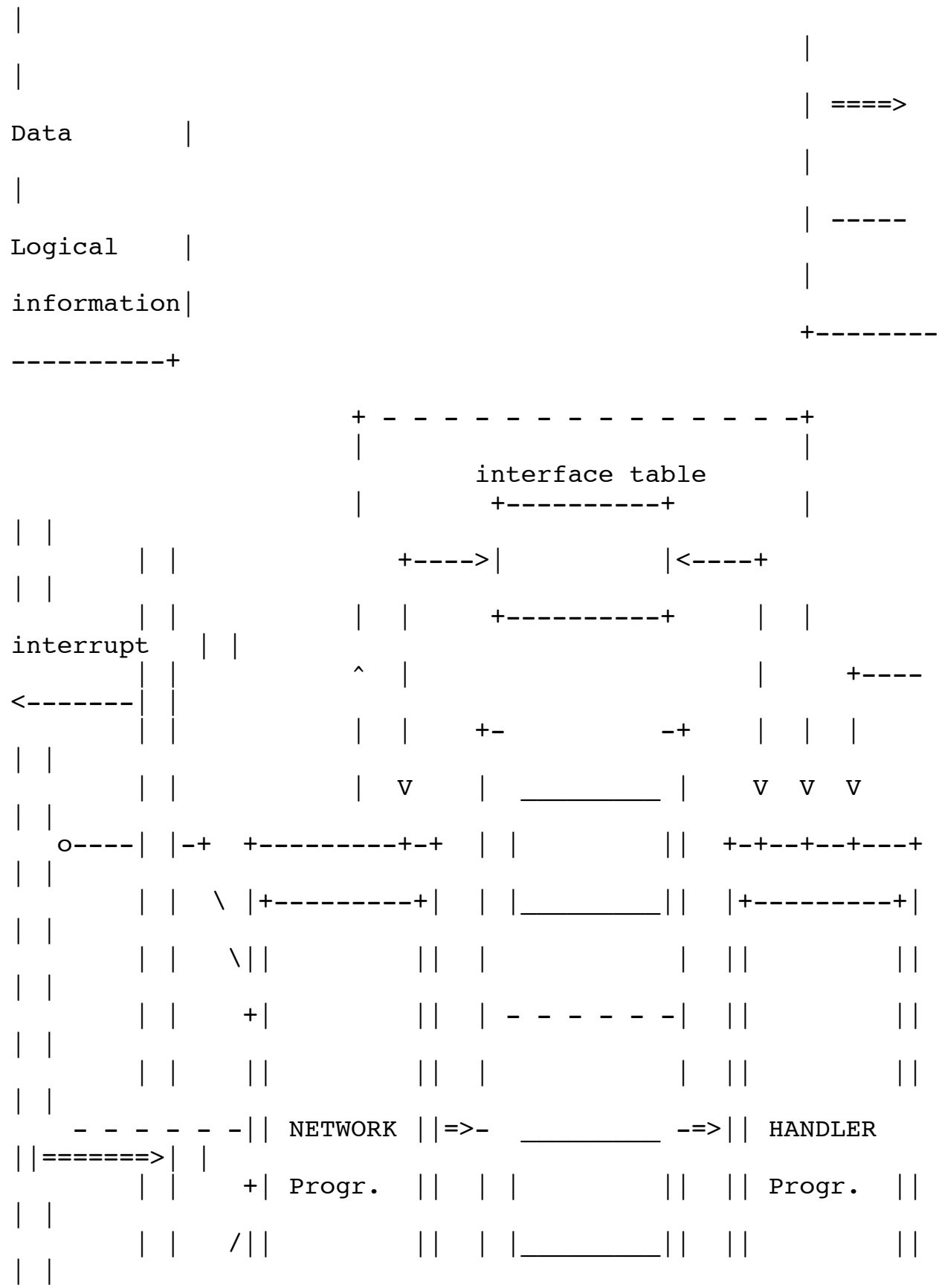
III-3. When does the Gordo documentation will be available in order to
design the user-network program interface. What are the
mechanisms for program initiations, transferring parameters from
one program to another, etc...

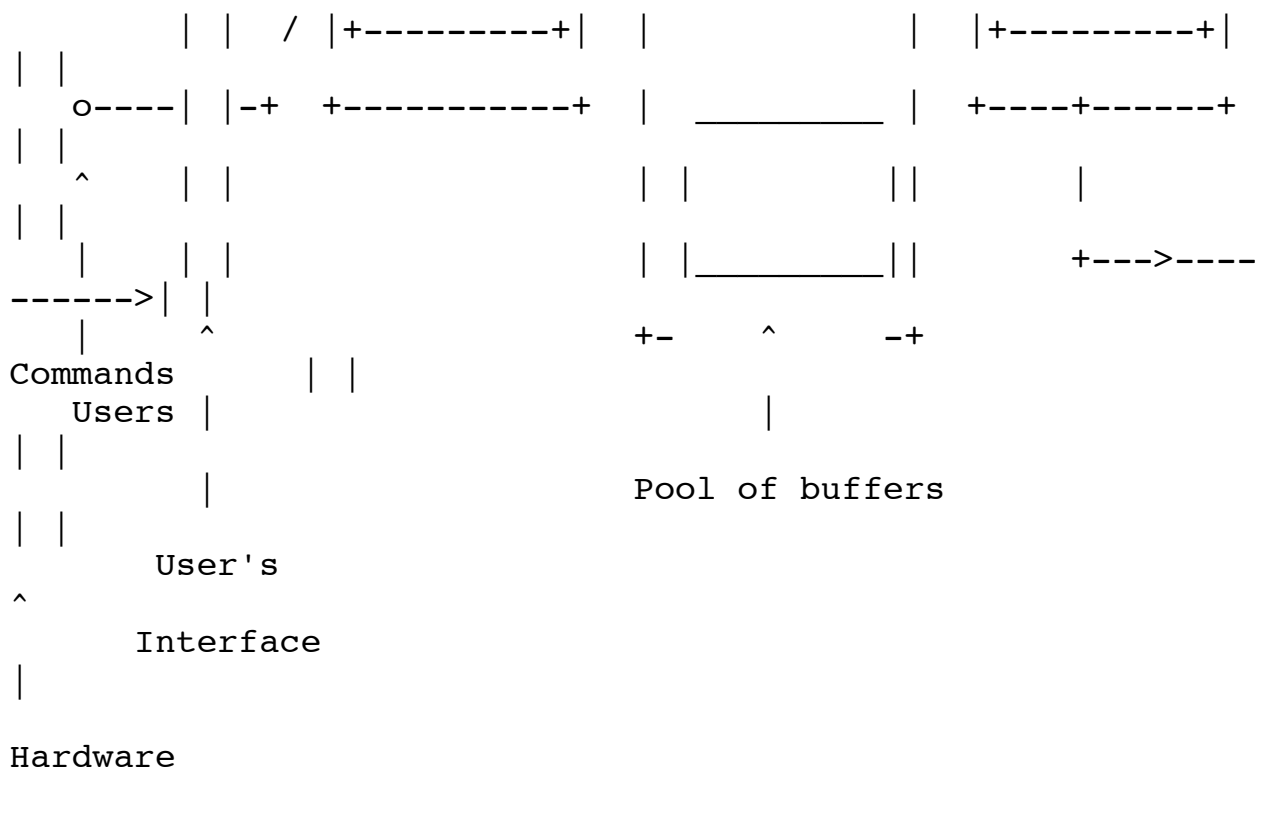



Input
Input
IMP
(Distribution)
HARDWARE
Interface
NETWORK
Program
HANDLER
Program

(Fig. 1)


interface


Data
Logical information
====>
-----
interface table
interrupt
NETWORK Progr.
HANDLER Progr.



(Fig. 2)

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