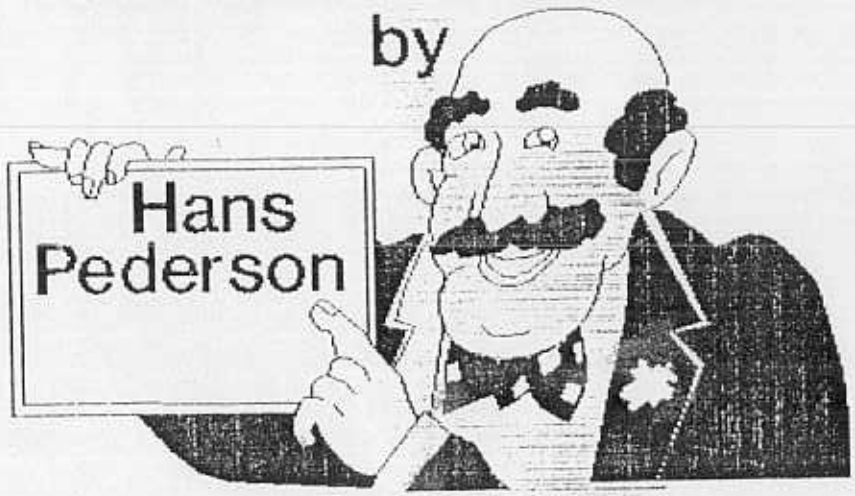
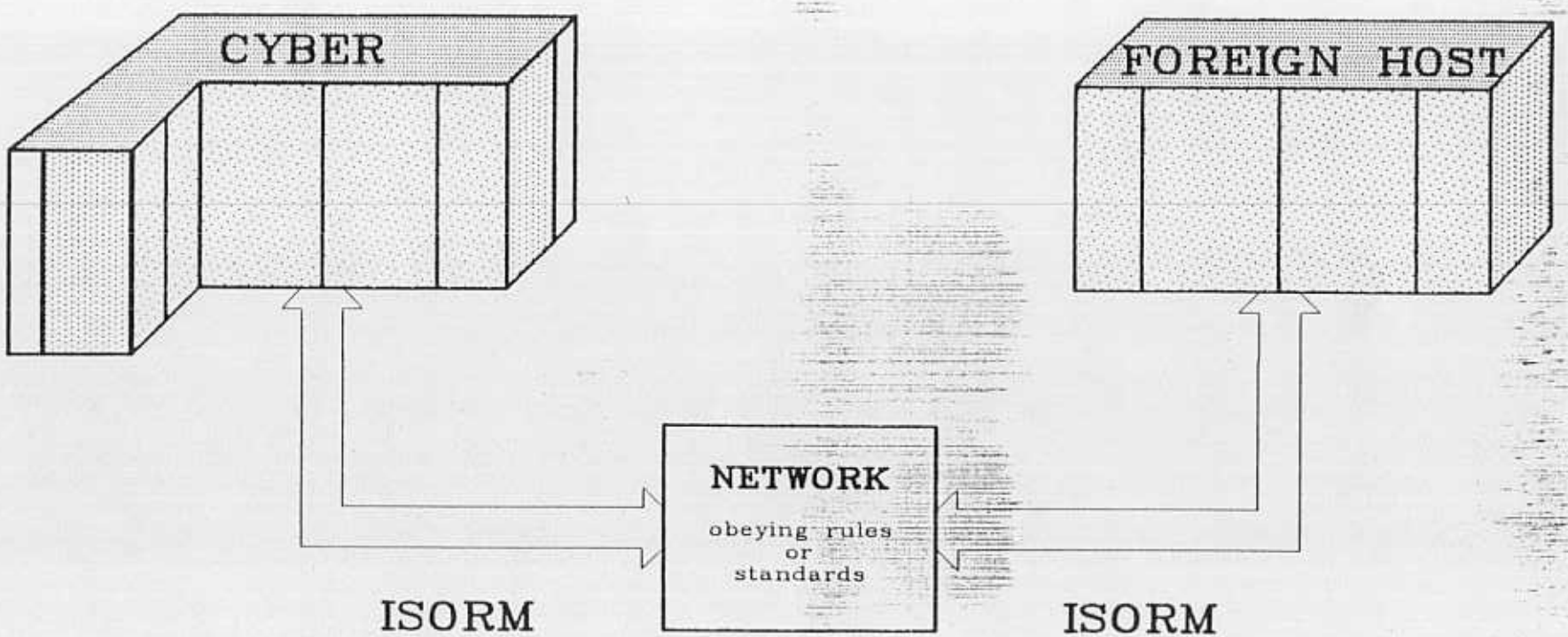
Communication Products and CDCNET Installation by



Supplements

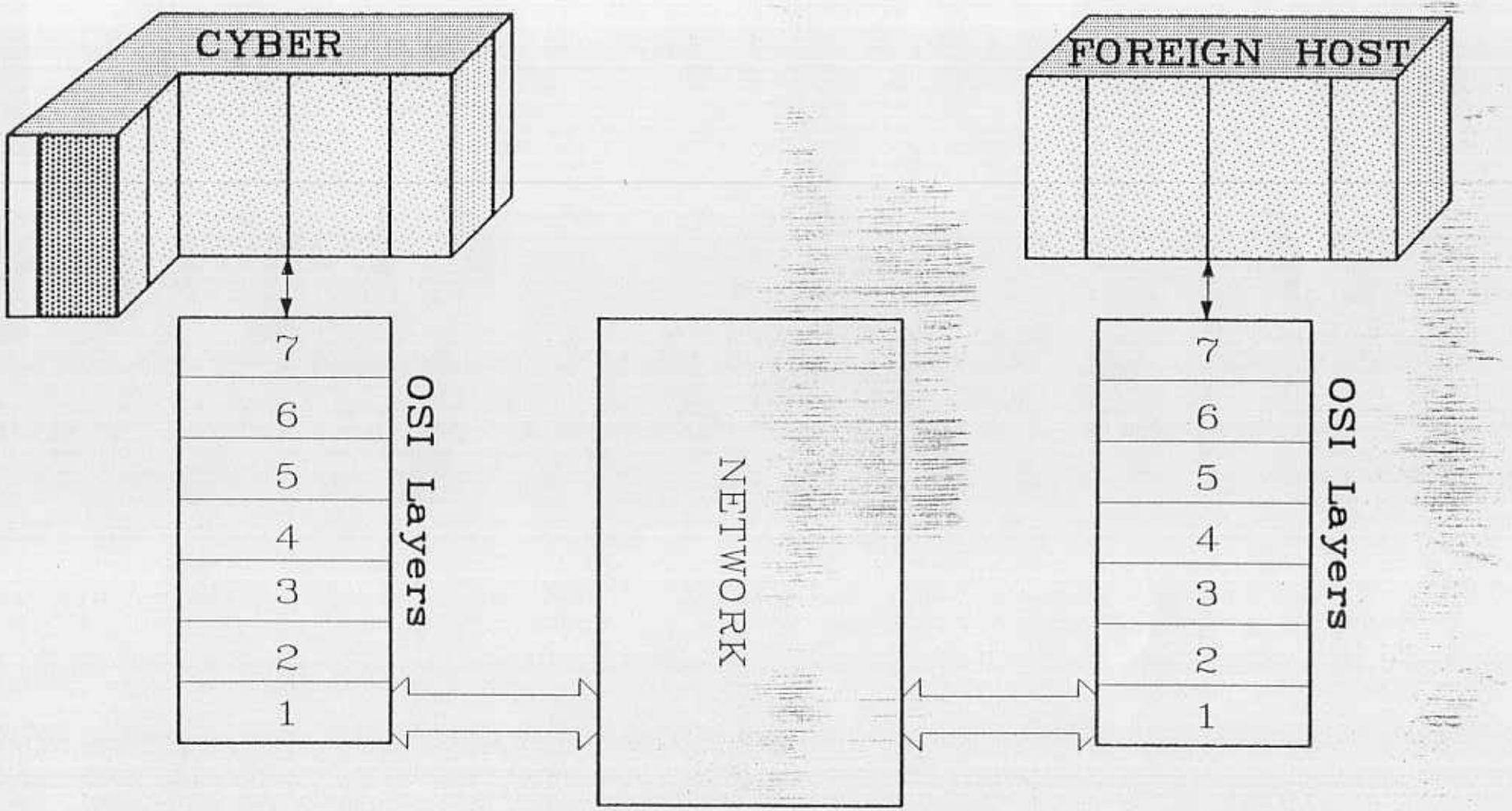
OSI

Open System Interconnection
OSI communication



International Standard Organization
Reference Model
(ISORM)
in both hosts

ISORM
International Standards Organization Reference Model

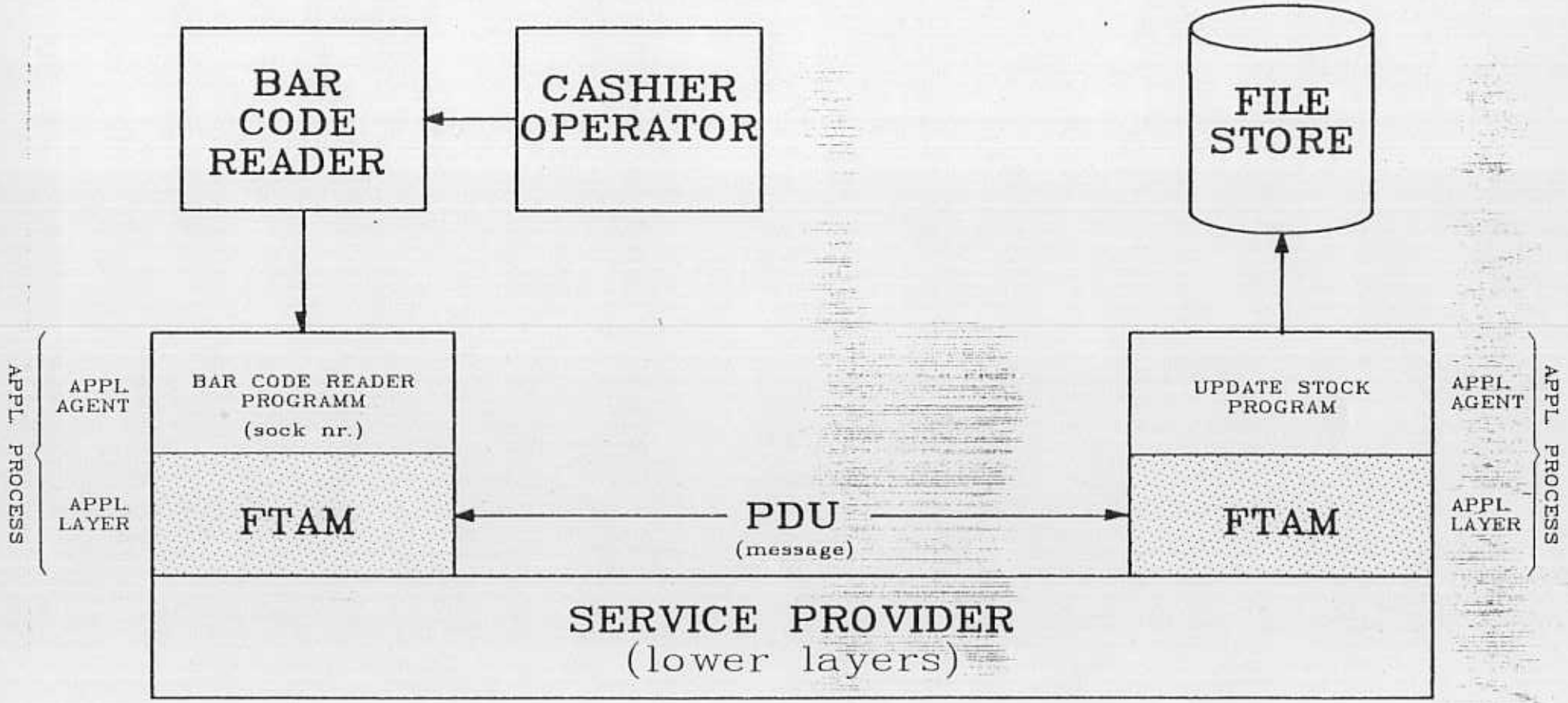


APPLICATION LAYER (7)

Provides system – independent application services such as the following

- **FTAM** (File Transfere Access and Management)
- **MOTIS** (Message Oriented Text Interchange System)
- **JTM** (Job Transfere and Manipulation)
- **VT** (Virtual Terminal)

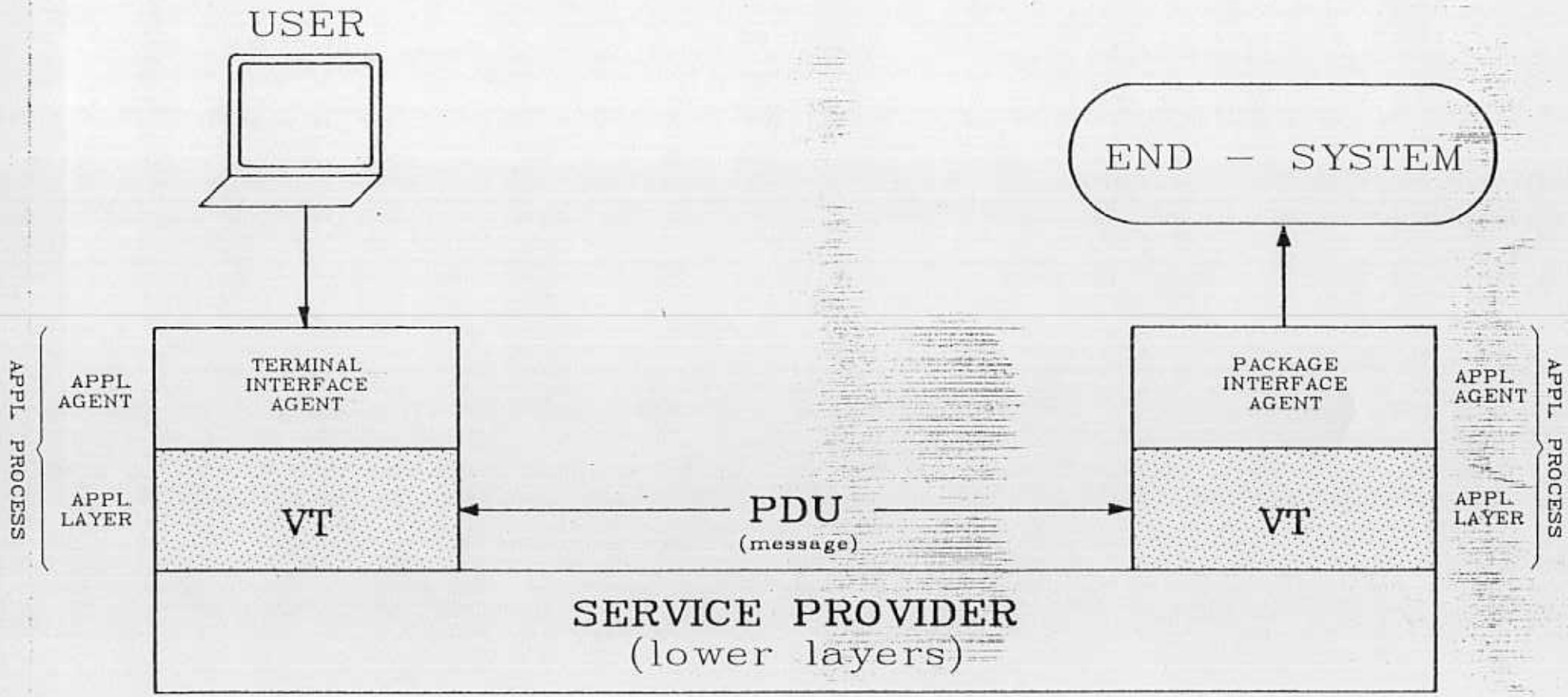
APPLICATION LAYER (7)



FTAM – File Transfere Access and Management

PDU – Protocol Data Unit acts as a message exchange between peer (like) layer. It is made up of control information

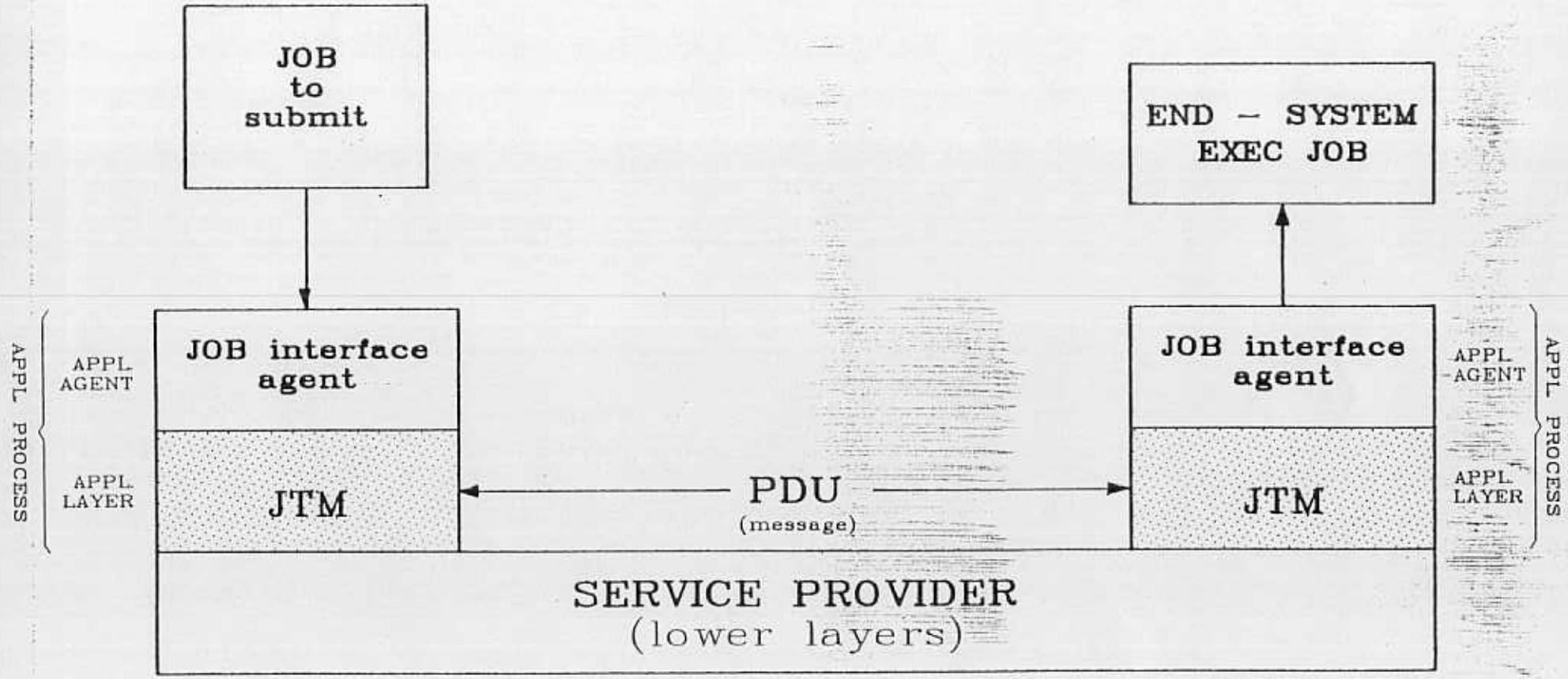
APPLICATION LAYER (7)



VIRTUAL TERMINAL (VT)

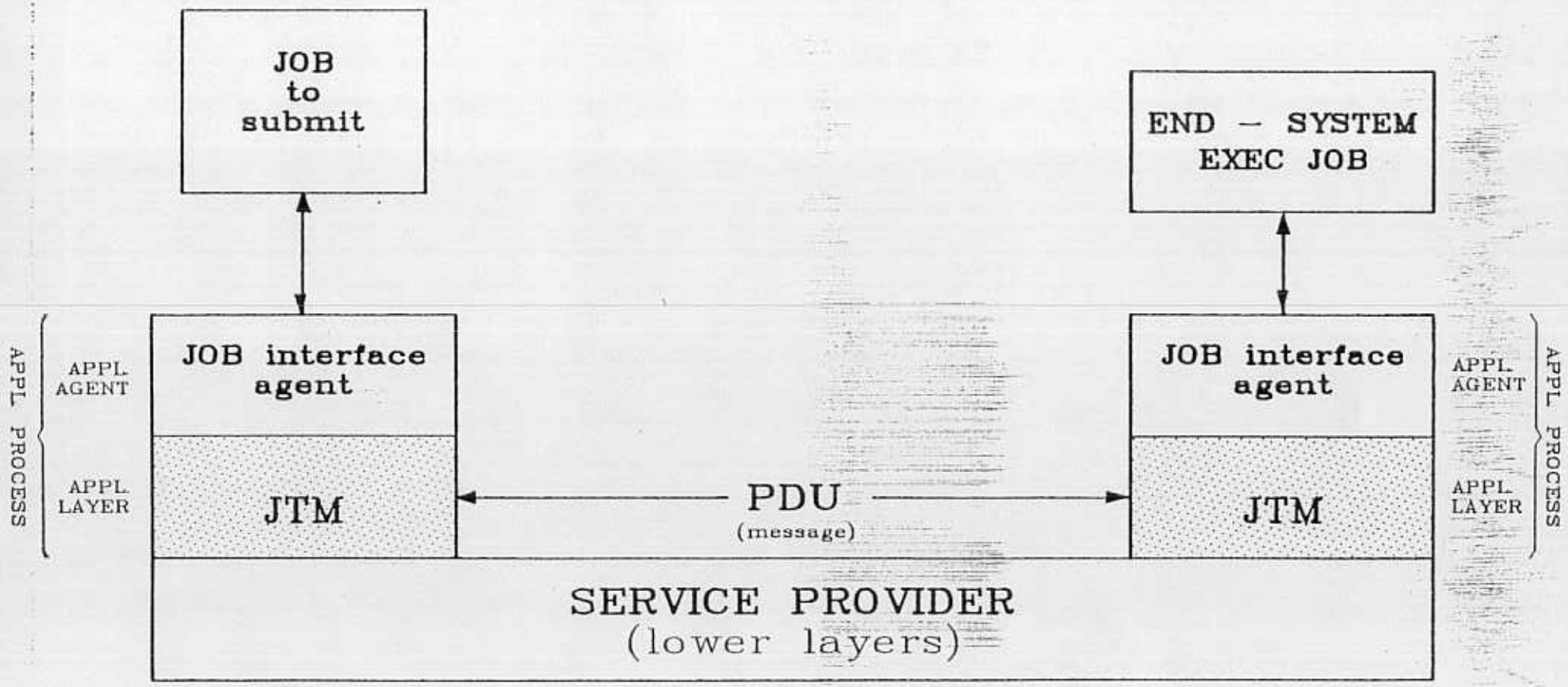
Presents to an END – SYSTEM a single terminal type and maps the characteristics of this Virtual Terminal to the real terminal involved.

APPLICATION LAYER (7)



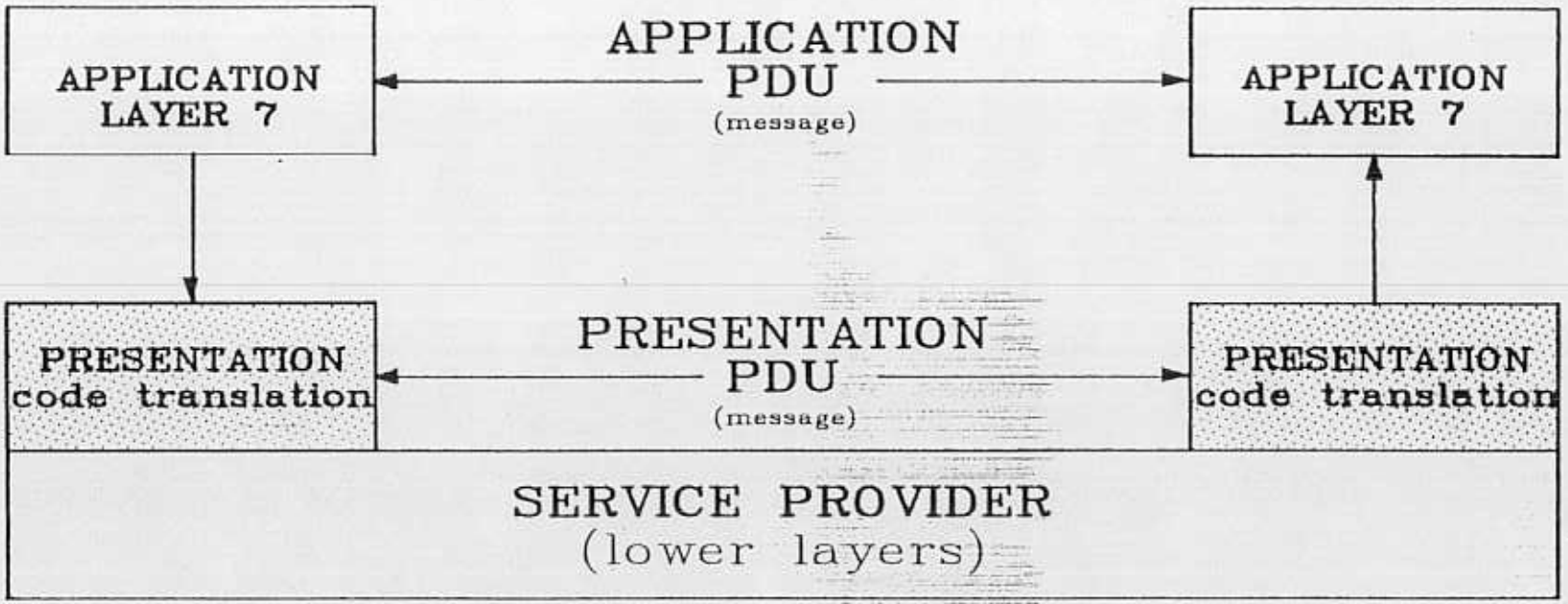
Job Transfere and Manipulation (JTM) is associated with job submission to remote computer systems.

APPLICATION LAYER (7)



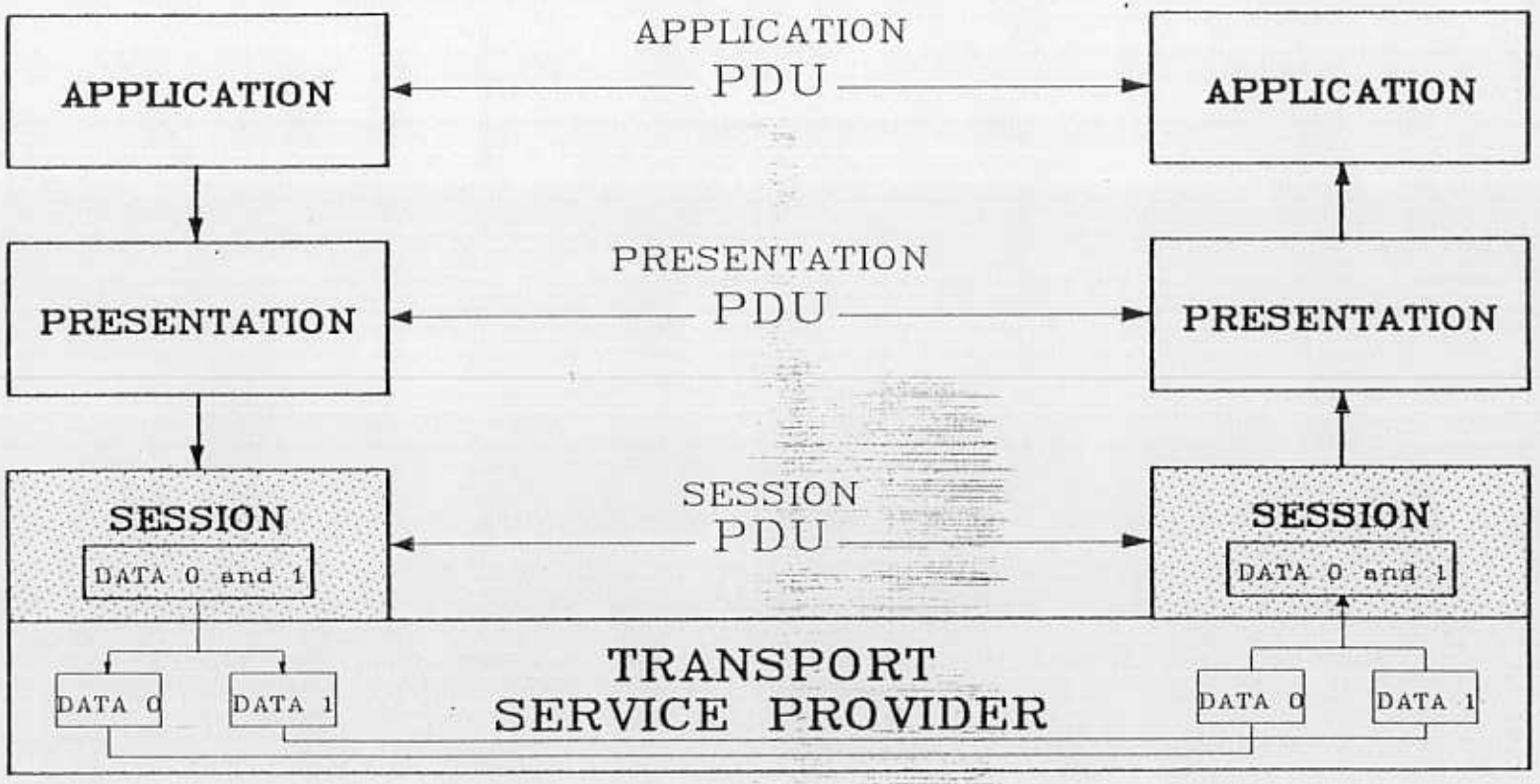
Job Transfere and Manipulation (JTM) is associated with job status,control, and output routing

PRESENTATION LAYER (6)



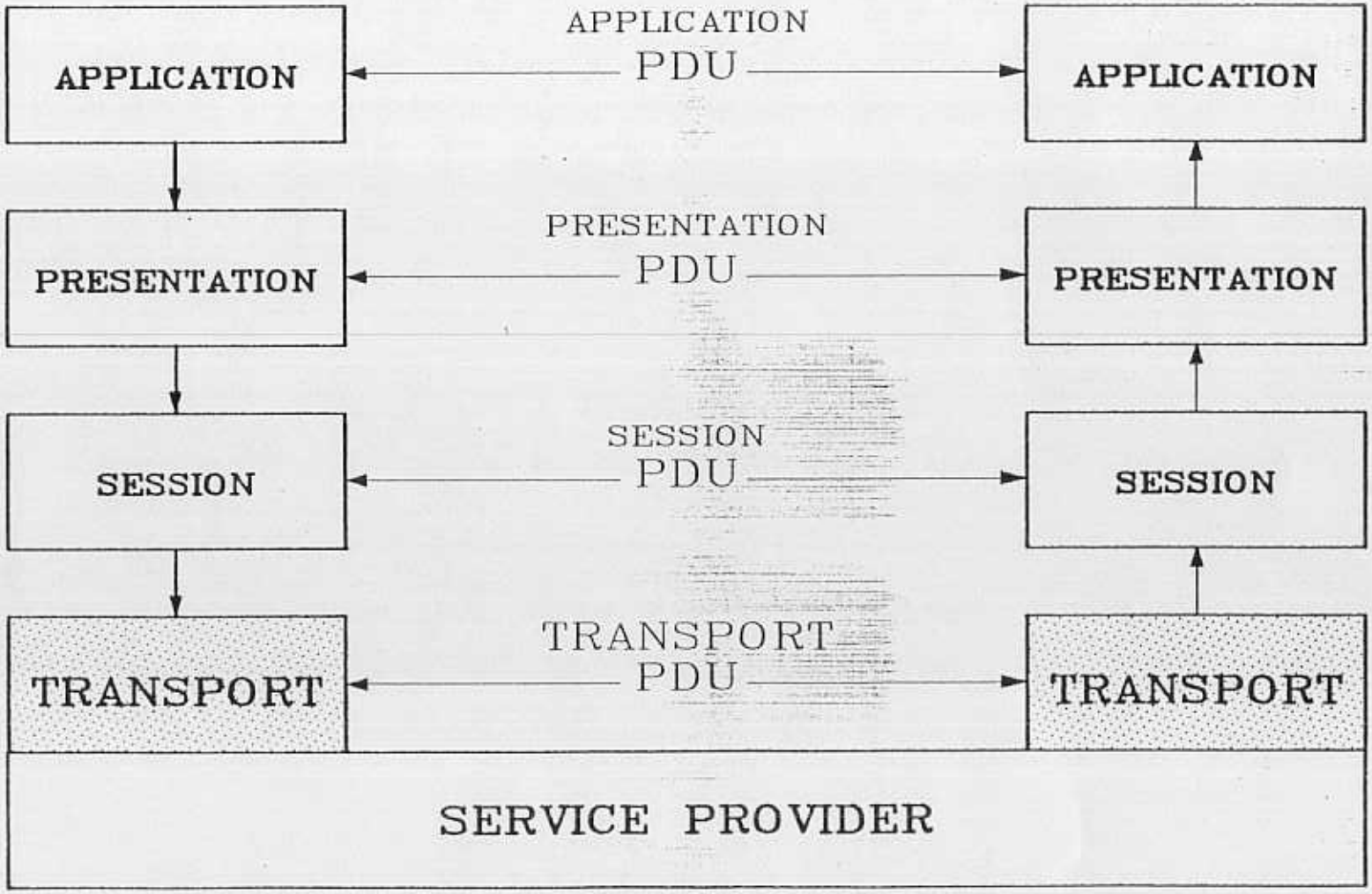
The PRESENTATION layer deals with information representation such as code translation

SESSION LAYER (5)



SESSION Layer provides data transfer, control and management services to enhance the reliable end – to – end transfere service provided by the layer below (transport).

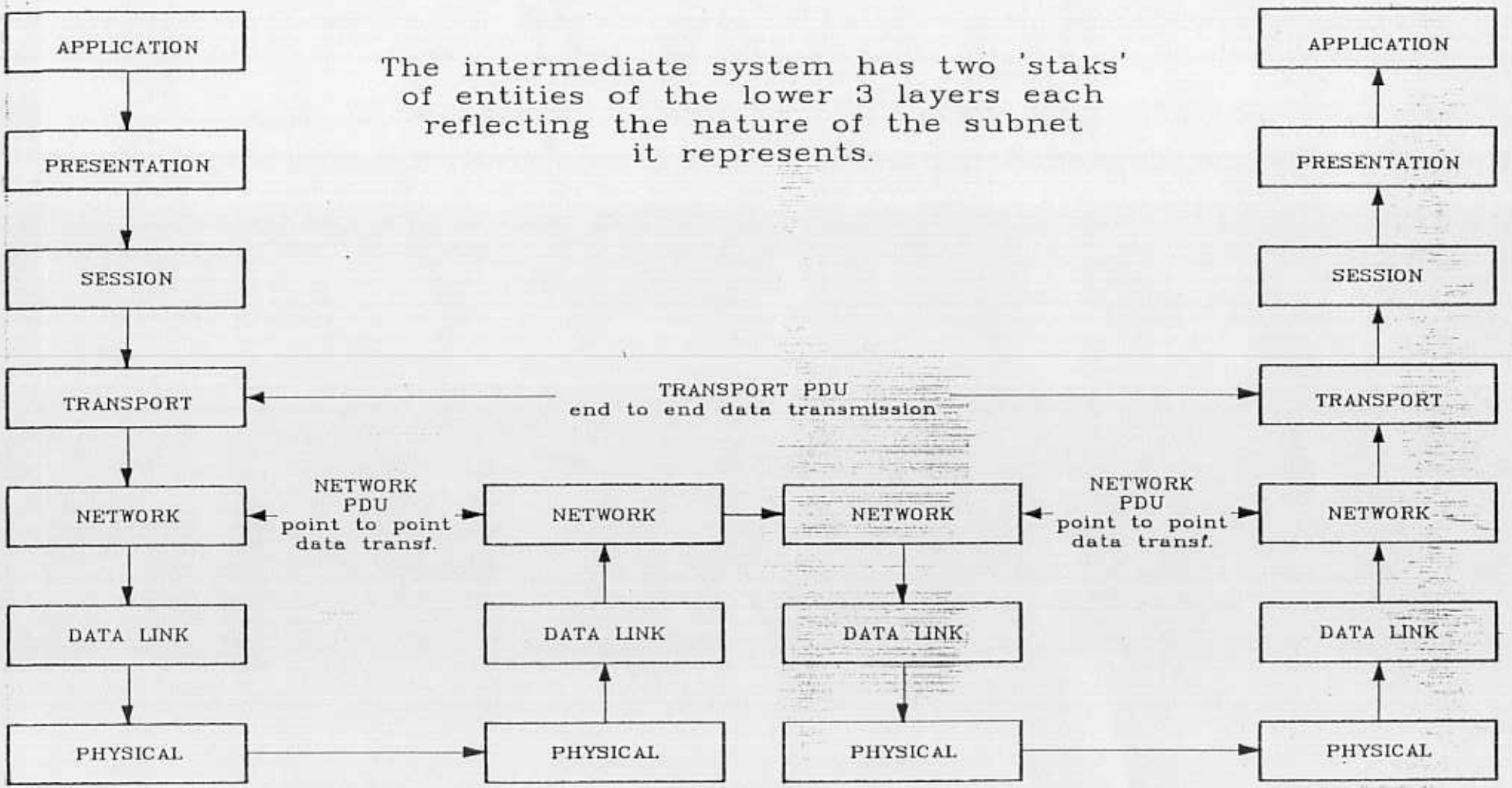
TRANSPORT LAYER (4)



The Tansport layer ensures a reliable end – to – end data transmission capability

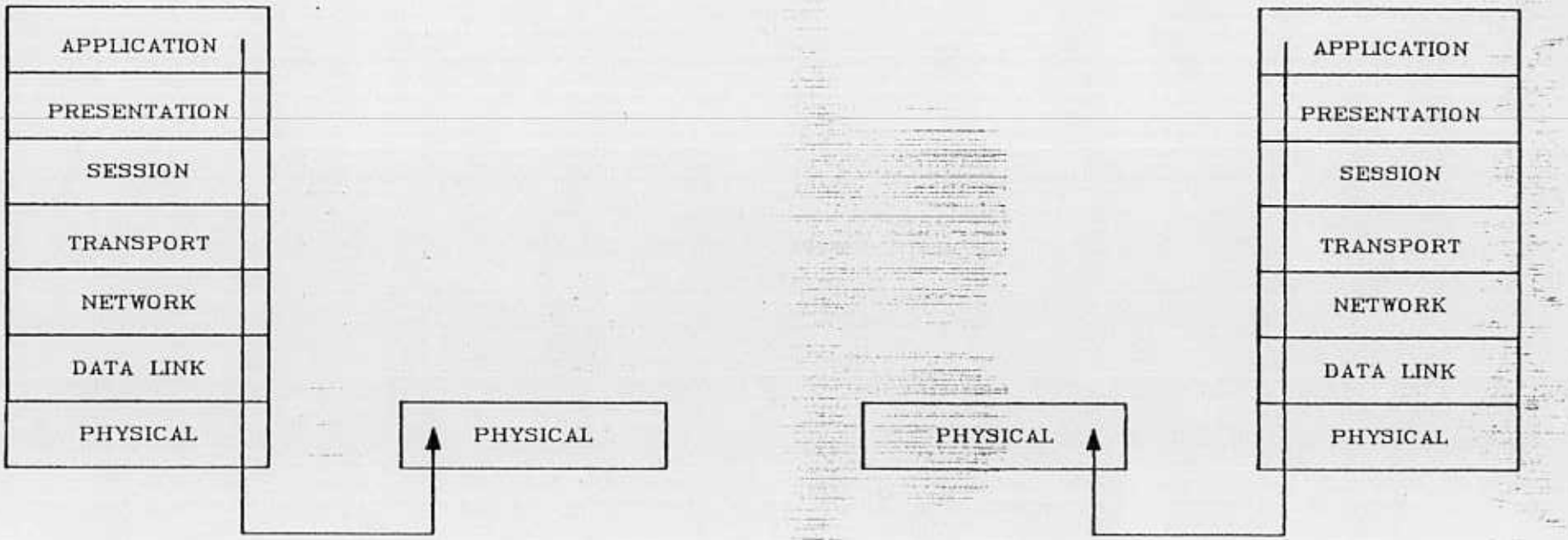
TRANSPORT LAYER (4)

The intermediate system has two 'staks' of entities of the lower 3 layers each reflecting the nature of the subnet it represents.



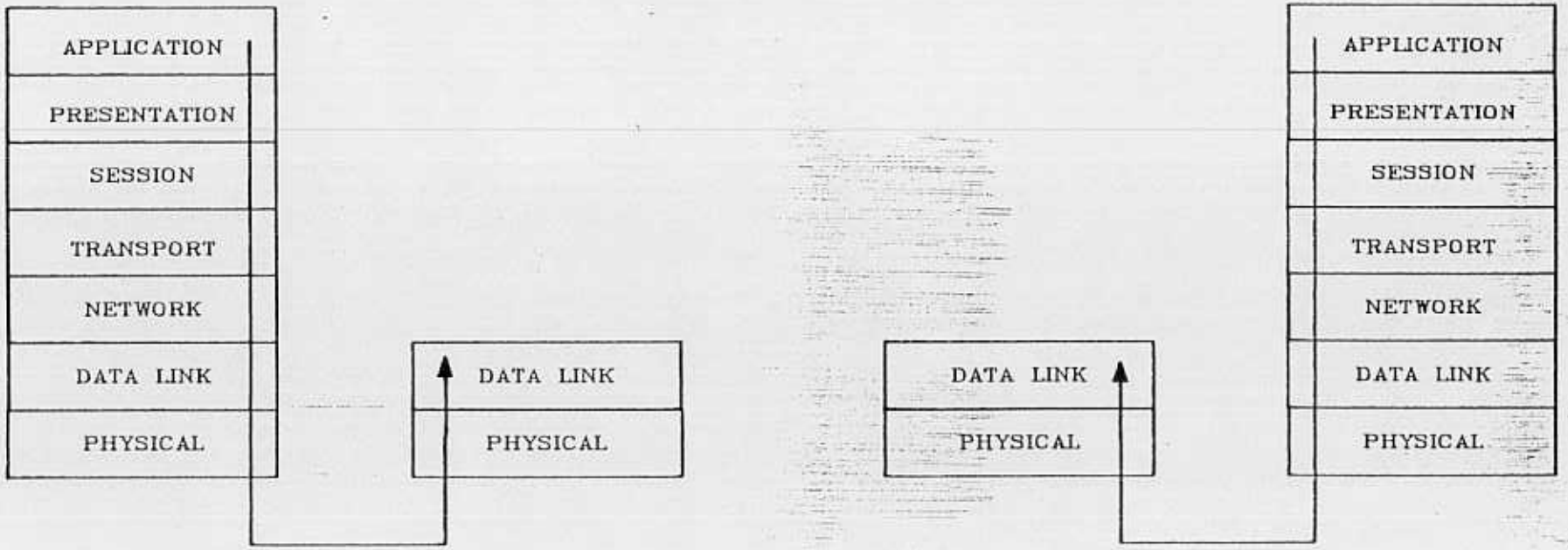
Cooperating end systems on different sub – networks

OSI CONNECTION
REPEATER



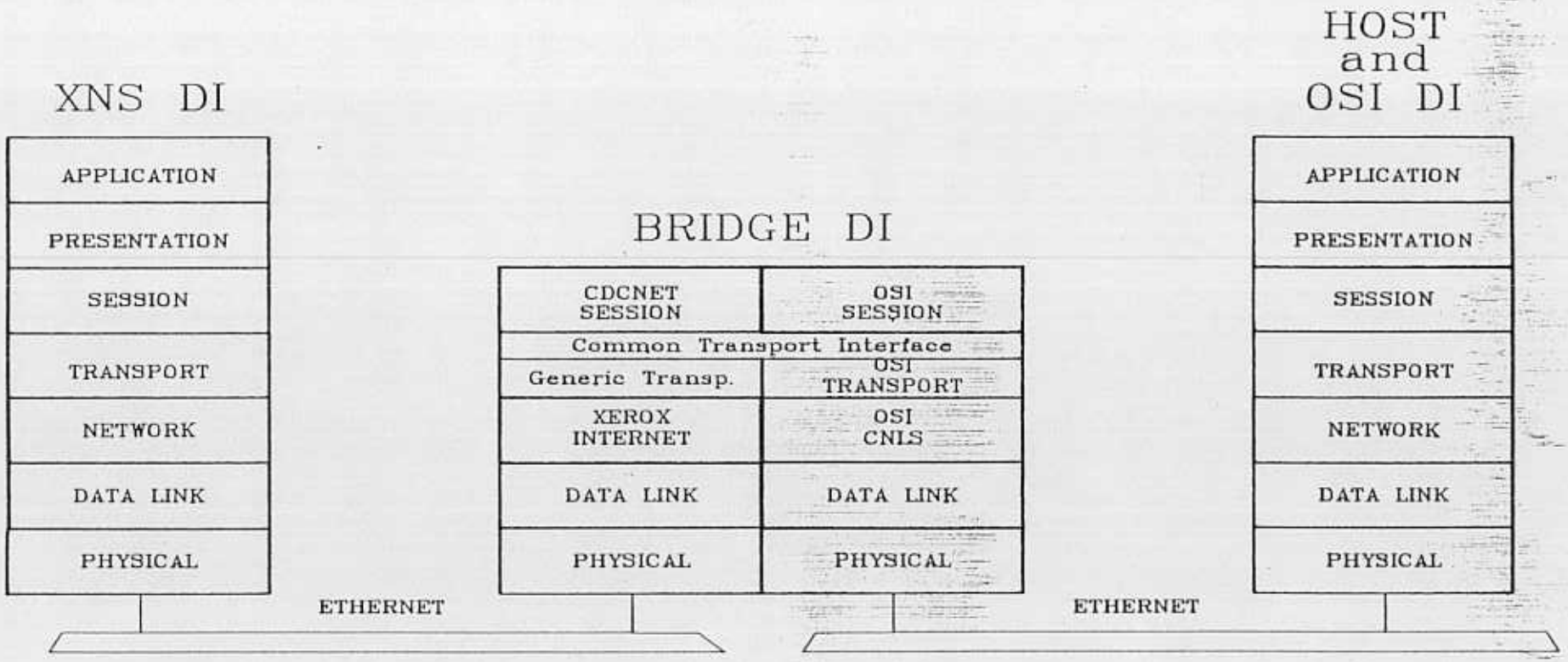
A REPEATER is a network device that extends the ETHERNET beyond one 500 Meter length of segment cable. It acts as a signal amplifier.
Repeaters function only at the PHYSICAL layer.

OSI CONNECTION BRIDGE



BRIDGES interconnect two networks using the same protocol, the same kind of transmission methods, and the same addressing structure. BRIDGES function at the DATA LINK layer.

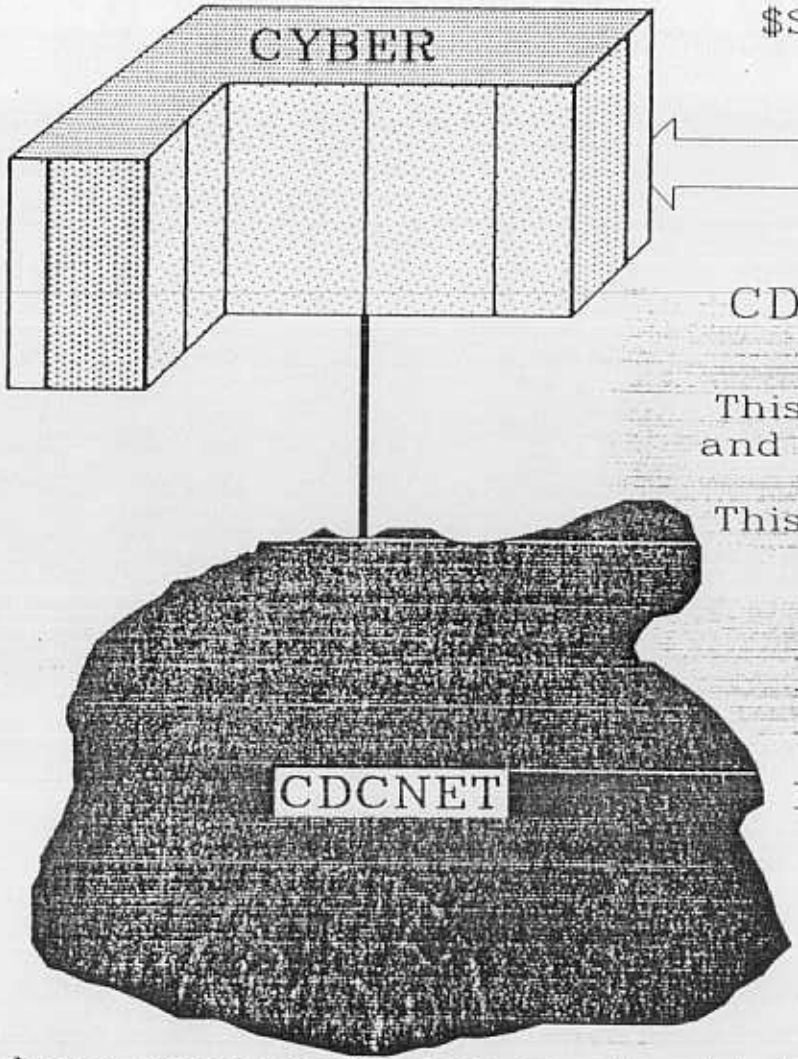
OSI CONNECTION BRIDGE



In the BRIDGE DI the XNS and the OSI protocoll stack can run concurrently. The CDCNET SESSION can use either the Generic Transport or the OSI Transport via the Common Transport Interface (CTI). Such a bridge supports to either XNS or OSI system. However, the bridge system does not allow a

CONFIGURATION

CDCNET Configuration



CDCNET.

$SYSTEM.SITE_CONTROLLED

CONFIGURATION

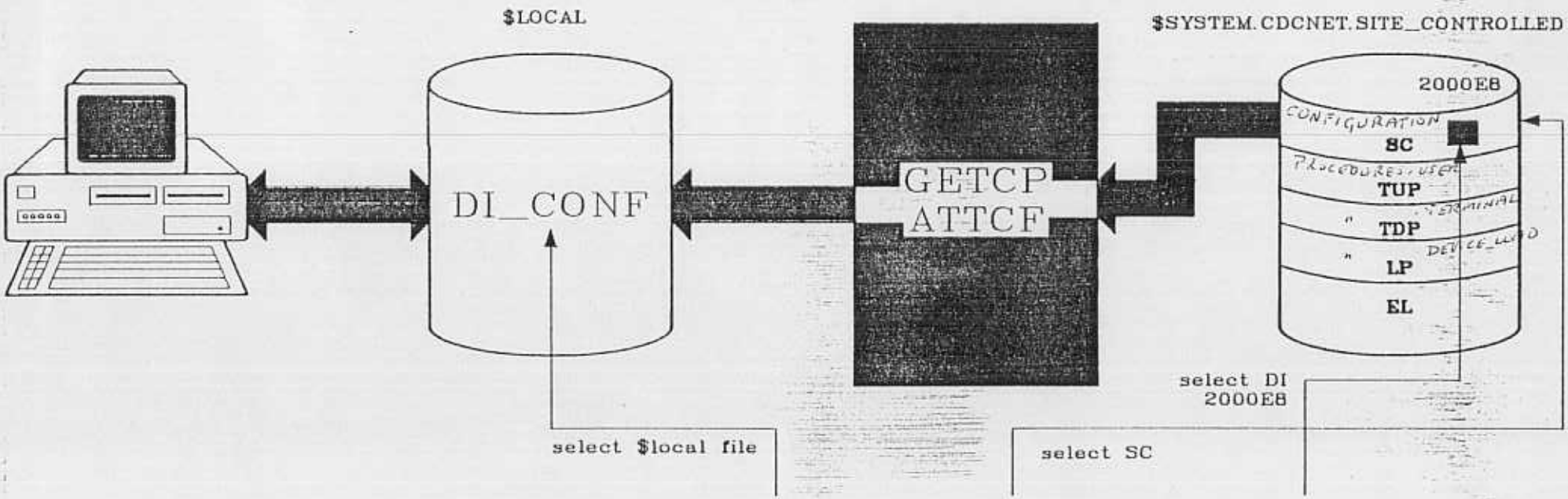
CDCNET configuration procedure file

This file defines the network and is executed whenever the network is activated.
This file can be manipulated via the following commands.

- GET_CDCNET_PROCEDURE (GETCP)
- ATTACH_CONFIGURATION_FILE (ATTCF)
- REPLACE_CDCNET_PROCEDURE (REPCP)
- DEFINE_CONFIGURATION_FILE (DEFCF)
- REPLACE_CONFIGURATION_FILE (REPCF)

To use the above commands you must add them to your command list. by entering CRECLE $SYSTEM.CDCNET.VERSION_INDEPENDENT.COMMAND_LIBRARY

GET_CDCNET_PROCEDURE ATTACH_CONFIGURATION_FILE (GETCP, ATTCF)

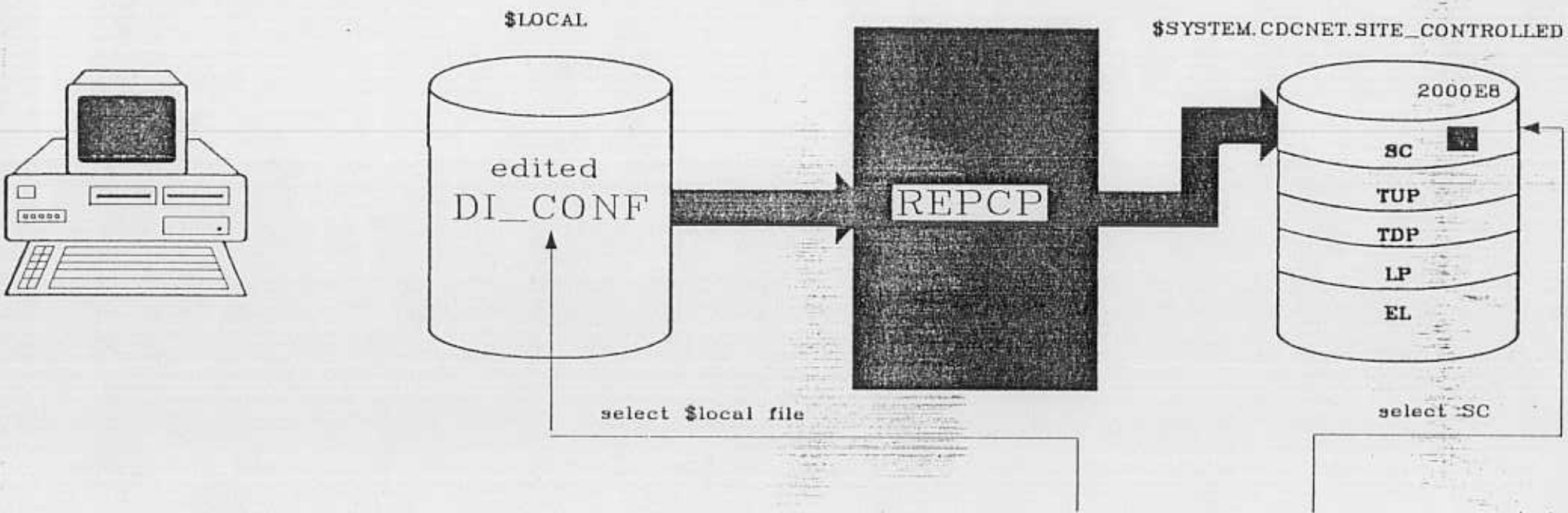


GET_CDCNET_PROCEDURE F=DI_CONF PT=SC PN=2000E8(16)

(specifiche DI)

Gets a configuration file or procedude library in the $SYSTEM.CDCNET.SITE_CONTROLLED catalog. GETCP has an alias named ATTCF.

REPLACE_CDCNET_PROCEDURE (REPCP)

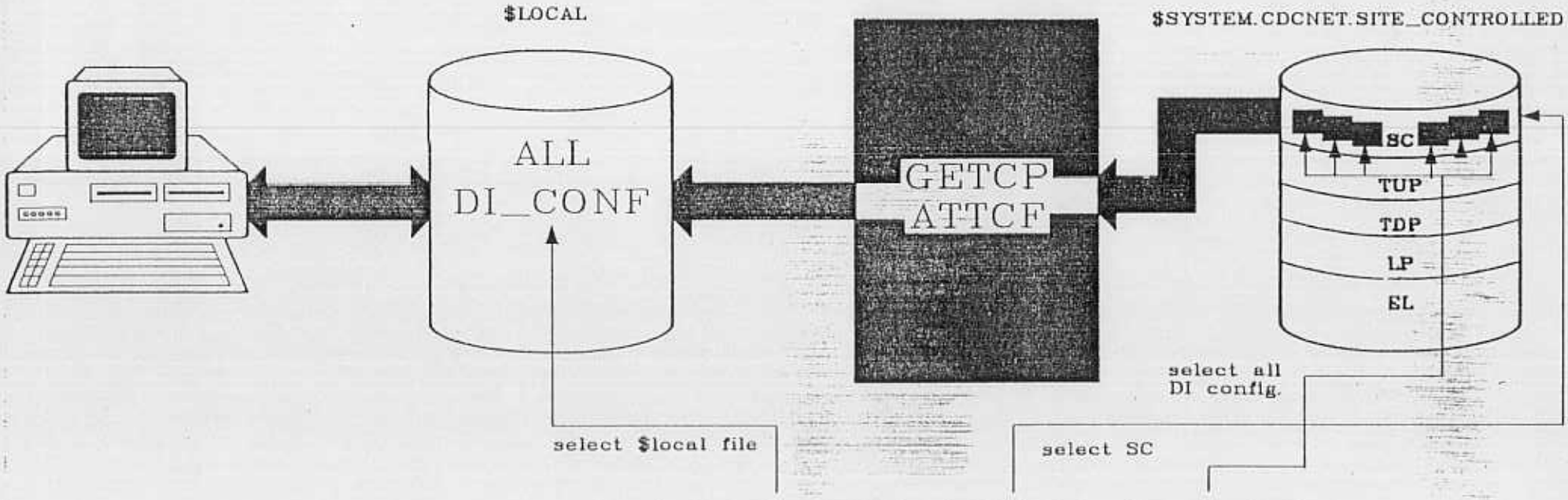


REPLACE_CDCNET_PROCEDURE F=DI_CONF PT=SC

Makes a new cycle

REPCP replaces the procedure in the approriate procedure library in $SYSTEM.CDCNET.SITE_CONTROLLED catalog.
The aliases to REPCP are DEFINE_CONFIGURATION_FILE (DEFCF) and REPLACE_CONFIGURATION_FILE (REPCF).

GET_CDCNET_PROCEDURE ATTACH_CONFIGURATION_FILE (GETCP, ATTCF)

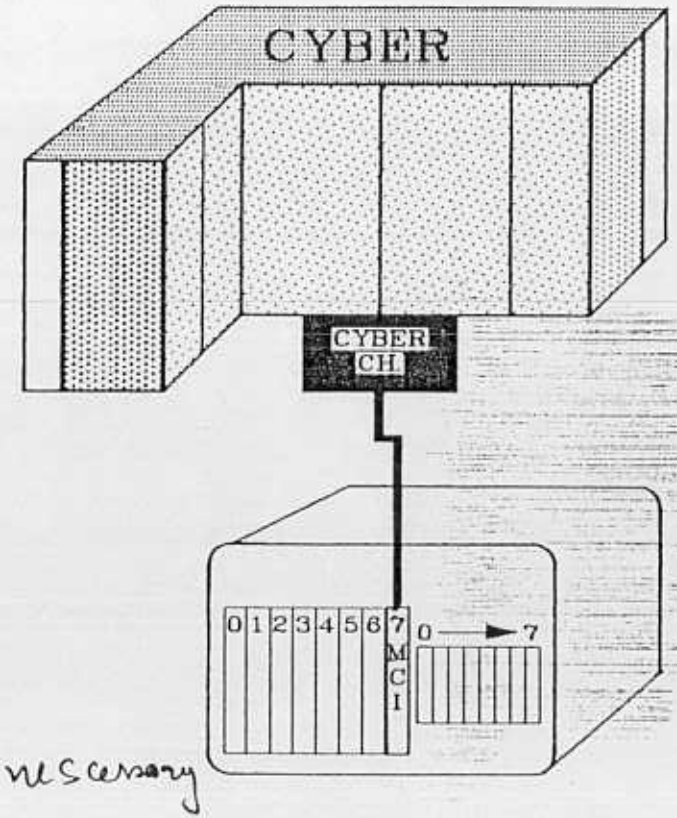


GET_CDCNET_PROCEDURE F=DI_CONF PT=SC PN=ALL

Gets a configuration file or procedude library in the $SYSTEM.CDCNET.SITE_CONTROLLED catalog. GETCP has an alias named ATTCF.

DEFINING CHANNELS

The DEFINE_VE_INTERFACE command is used to define the channel connection of the DI.

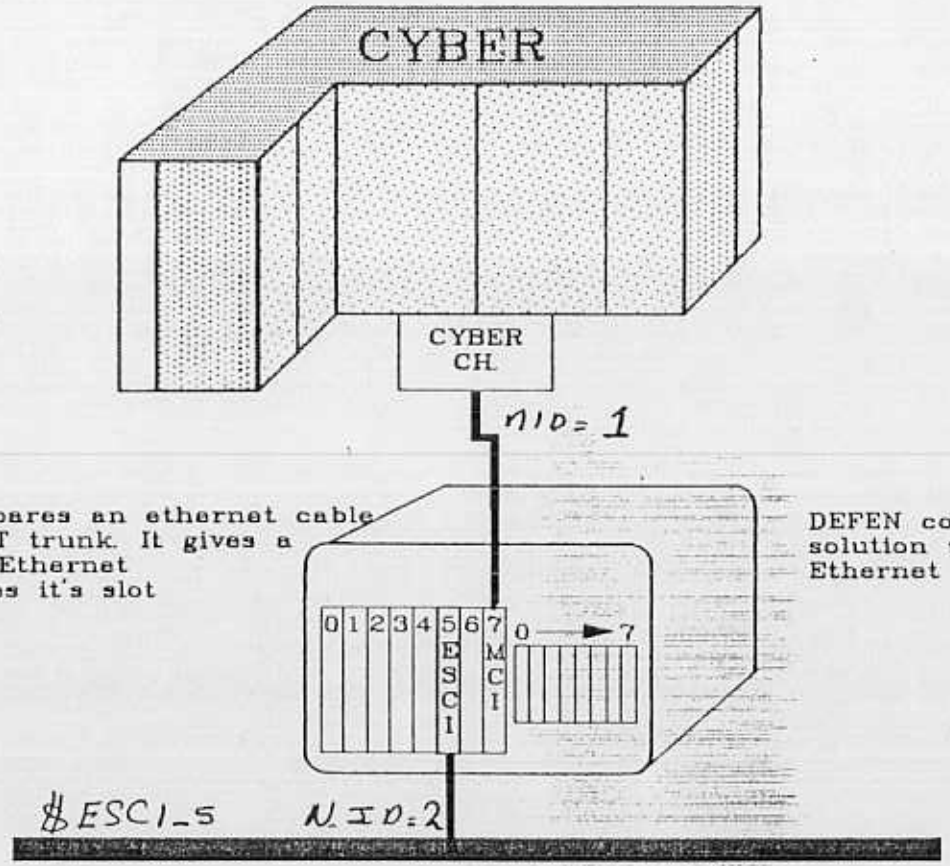


for load source not necessary

DEFVI INTERFACE_SLOT=7 INTERFACE_NAME=$MCI_7 NETWORK_ID=1

This command defines the MCI board to be in slot location 7. The logical name of this board is $MCI_7 and the NETWORK_ID is 1.

DEFINING the ETHERNET



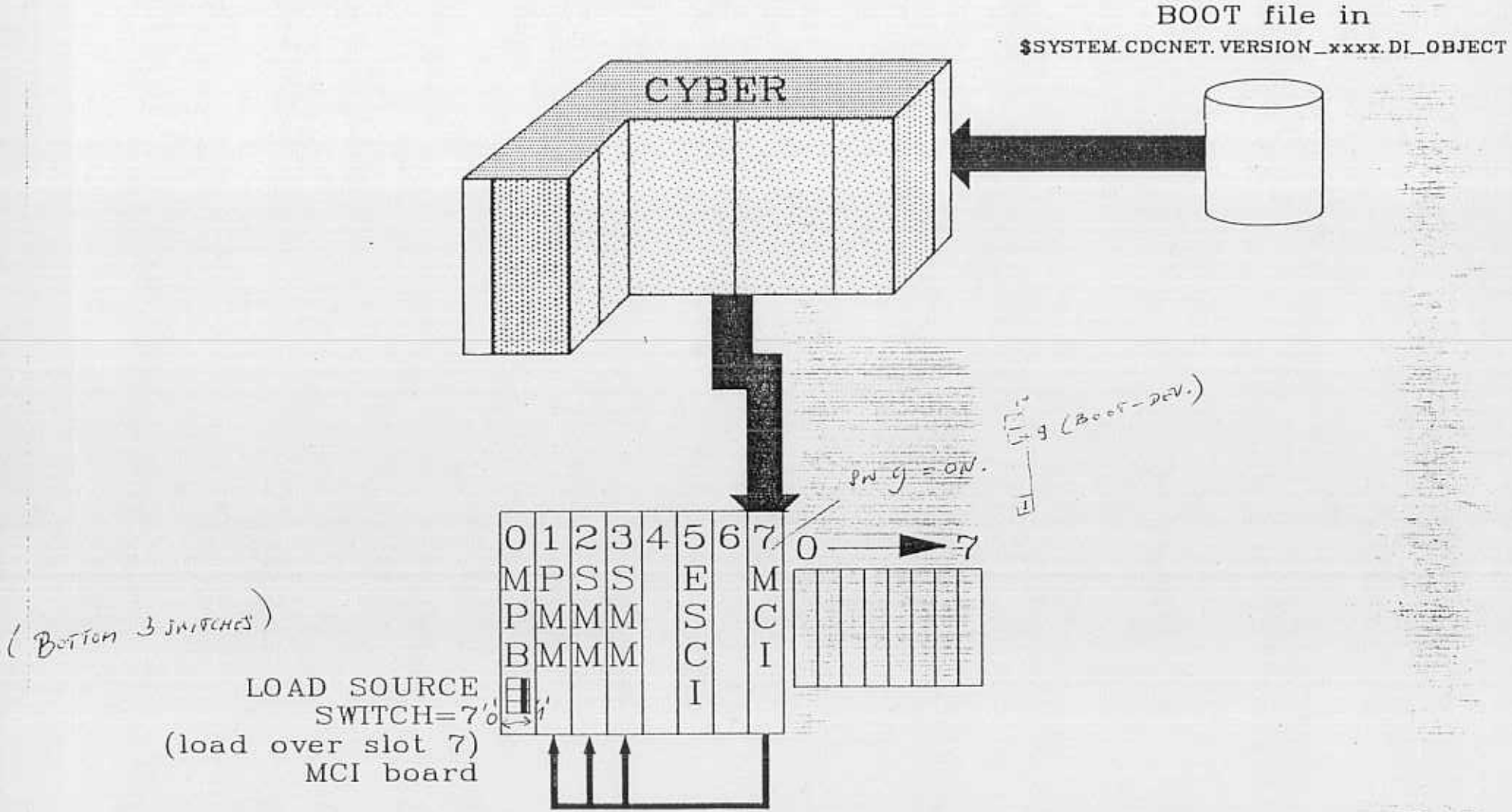
DEFET command prepares an ethernet cable to serve as a CDCNET trunk. It gives a logical name to the Ethernet logic card and defines it's slot

DEFEN configures a CDCNET network solution using a previously defined Ethernet trunk.

```
DEFINE_ETHER_TRUNK SLOT=5 TRUNK_NAME=$ESCI_5
DEFINE_ETHER_NET TN=$ESCI_5 NETWORK_ID=2 COST=0A(16)
```

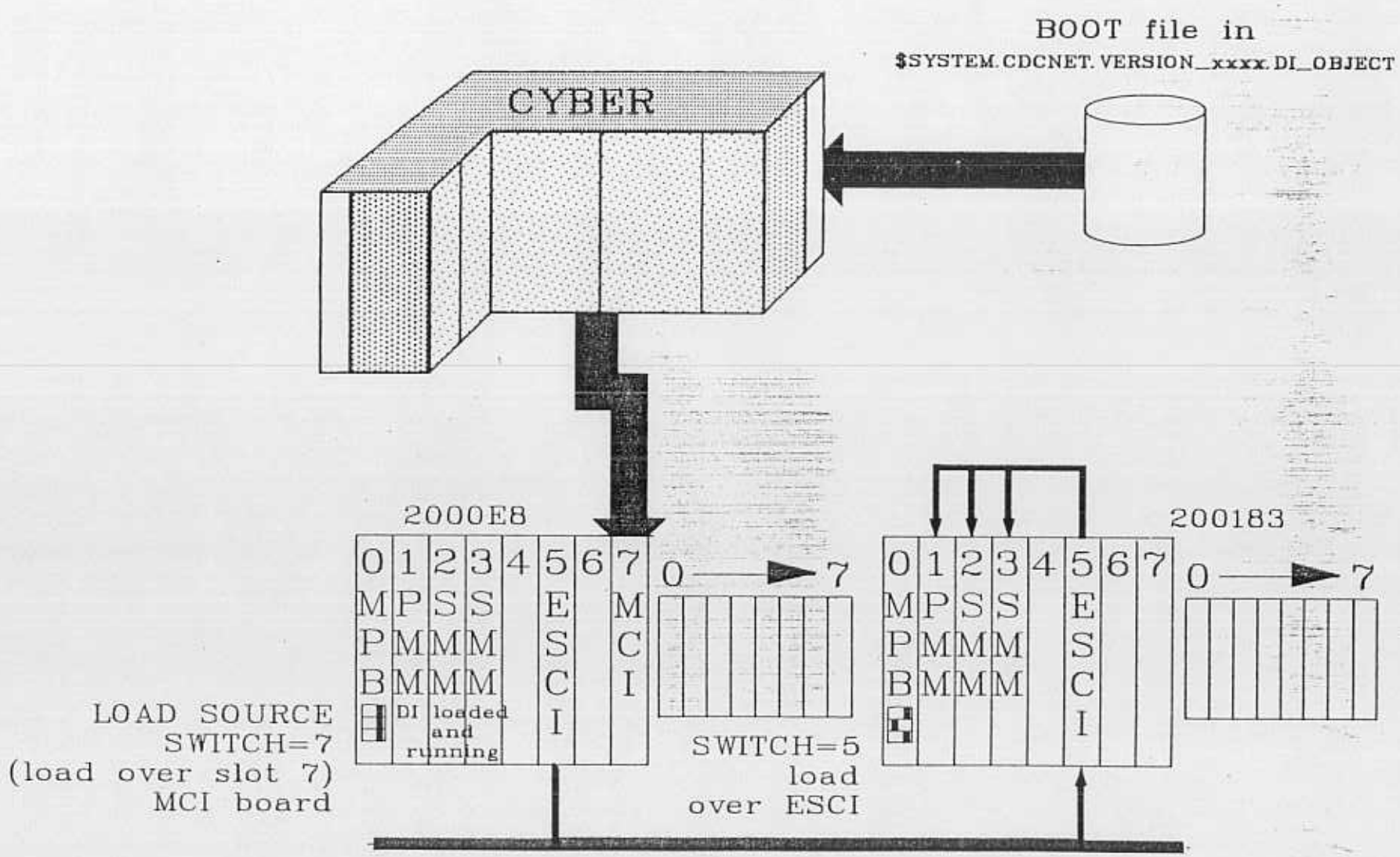
The two commands above define the ethernet connection in the DI. The ethernet logic card is in slot 5 and the logical name of that card is $ESCI_5.This ethernet card has a unique network id of 2 and the cost of it's trafic has been set to 0A(16).
The cost is calculated by the following formula:
cost=100000000/transfere rate in bits per second
cost=100000000/10000000 (for the ethernet)
cost = 10(10) =0A(16)

DI BOOT



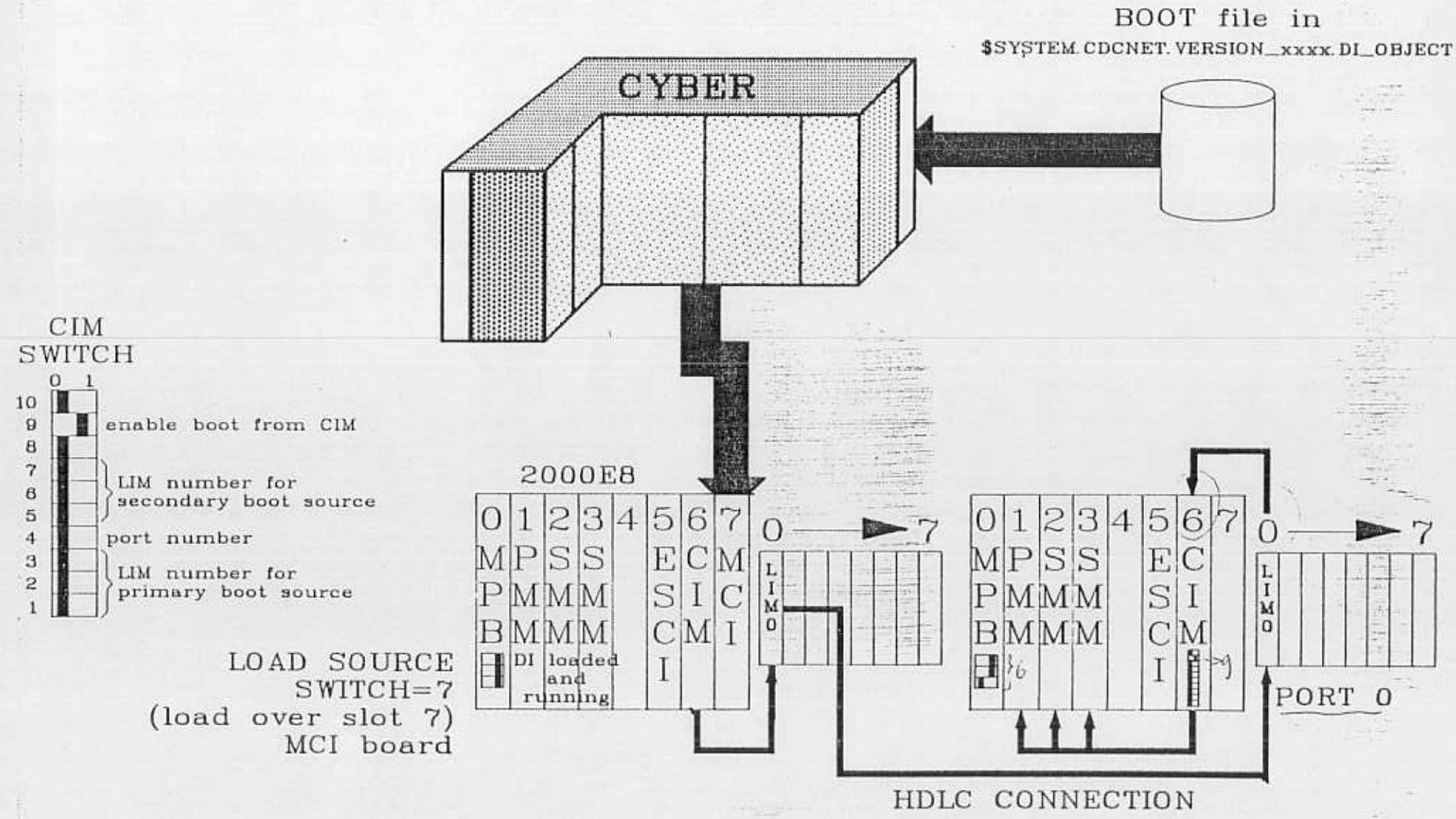
The load source switch on the MPB board defines over which slot (board) the DI software will be loaded into the memory (PMM,SMM)

DI BOOT



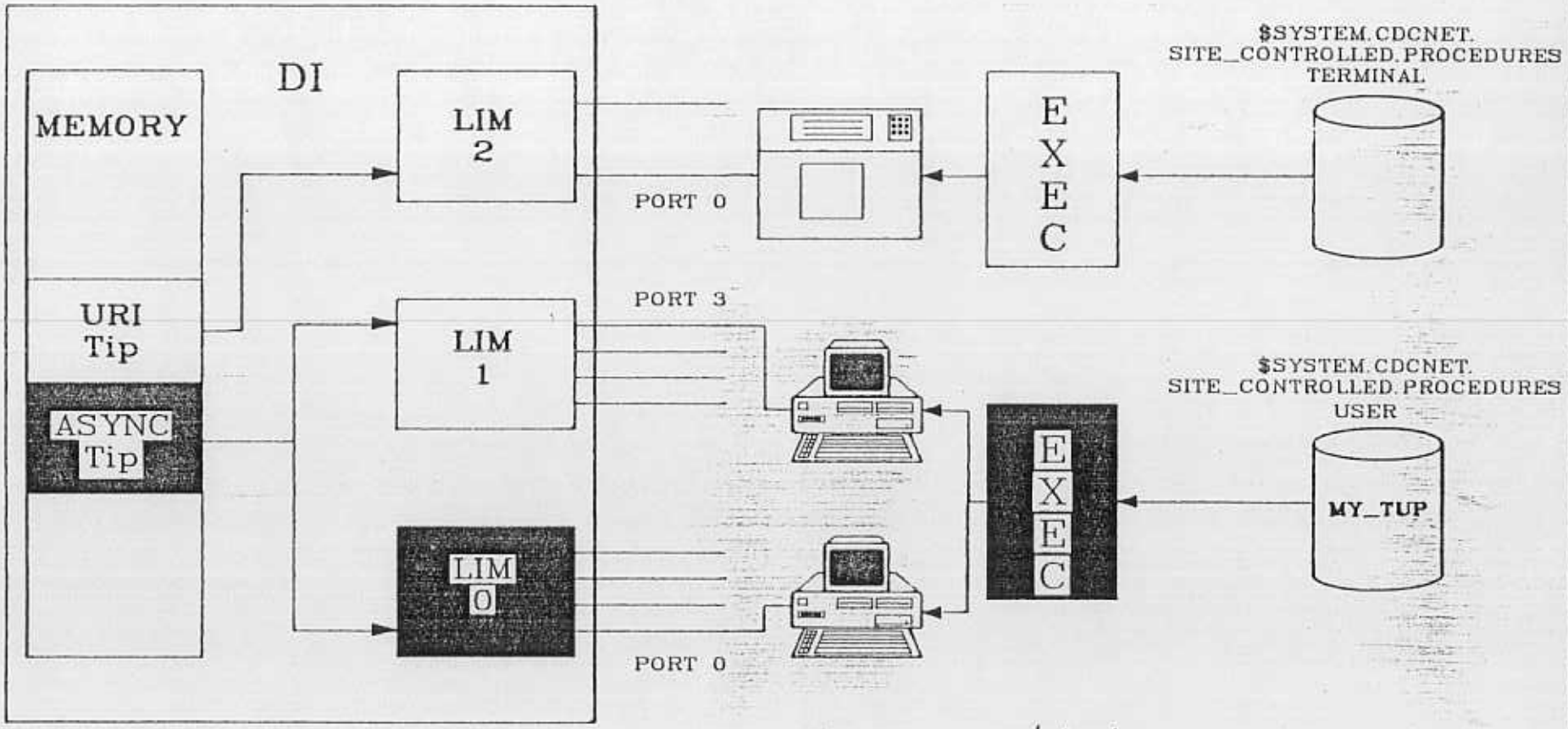
The load source switch on the MPB board defines over which slot (board) the DI software will be loaded into the memory (PMM,SMM)

DI BOOT



The load source switch on the MPB board defines over which slot (board) the DI software will be loaded into the memory (PMM,SMM)

DEFINE_LINE

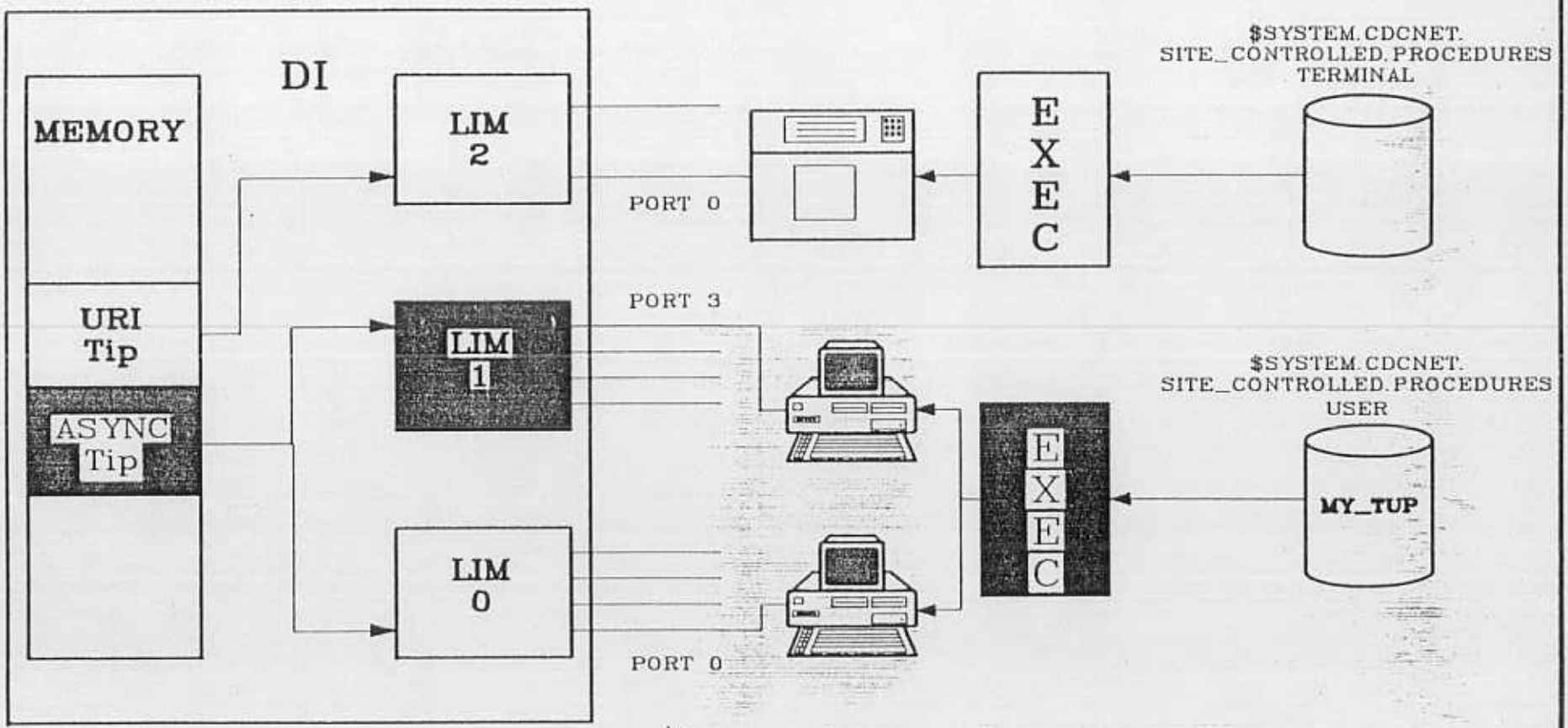


DEFINE_LINE LIM=0 PORT=0 TIP_NAME=ASYNCTIP LINE_NAME=L00 LINE_TYPE=SWITCHED LINE_SPEED=9600 ..

AUTO_RECOGNITION=SCP TERMINAL_USER_PROCEDURE=MY_TUP

The DEFINE_LINE command defines the logical name, physical hardware address, the name of the TIP that serves the line, the physical line attributes, and connection timeout values of a single communication line or URI parallel interface line.

DEFINE_LINE



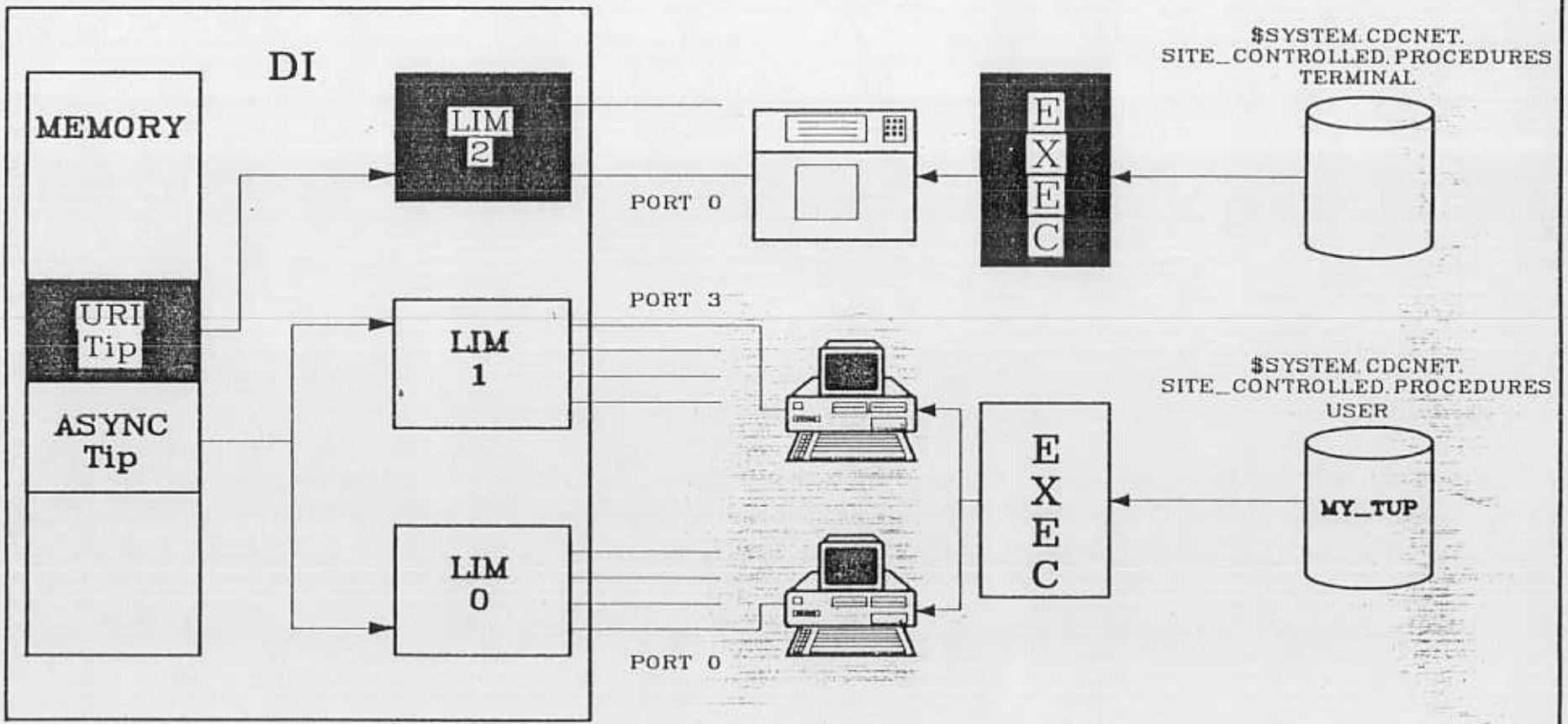
TN=ASYNC Tip

dedicated

DEFINE_LINE LIM=1 PORT=3 LN=L13 LT=~~SWITCHED~~ LS=4800 AR=SCP TUP=MY_TUP

The DEFINE_LINE command defines the logical name,physical hardware address, the name of the TIP that serves the line,the physical line attributes, and connection timeout values of a single communication line or URI parallel interface line.

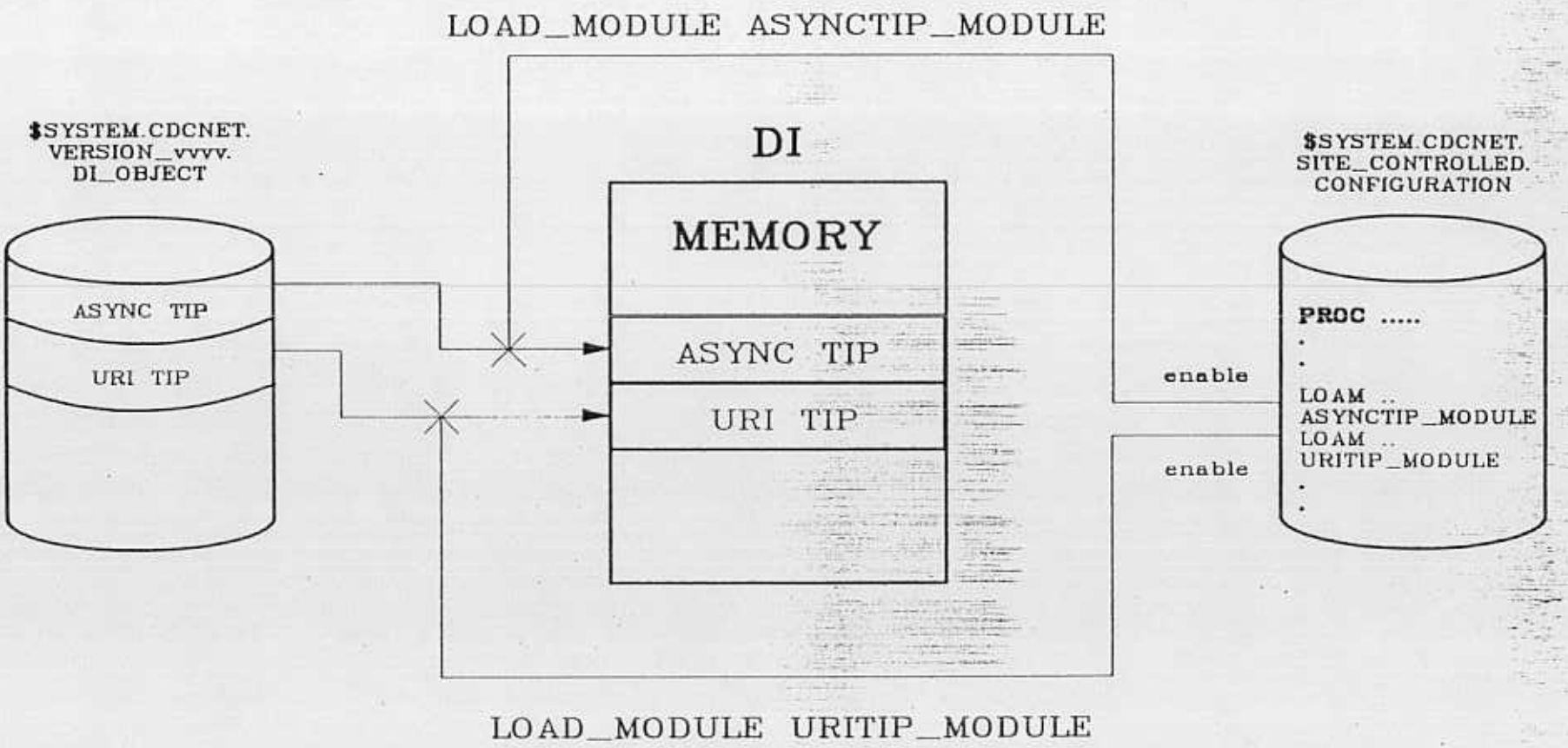
DEFINE_LINE



DEFL LIM=2 PORT=0 TN=URITIP LN=20 LT=DEDICATED TDP=MY_TDP

The DEFINE_LINE command defines the logical name, physical hardware address, the name of the TIP that serves the line, the physical line attributes, and connection timeout values of a single communication line or URI parallel interface line.

LOAD_MODULE

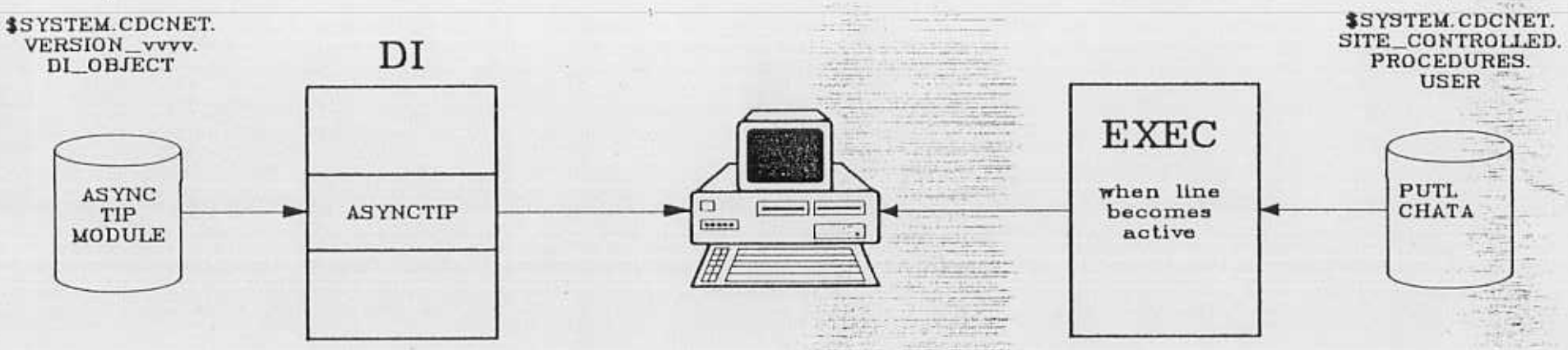


The LOAD_MODULE command causes the TIP to be loaded into the DI memory during the Load Process.

DEFINE_TIP

The DEFINE_TIP command defines the software that resides in a TDI that enables Terminals/Workstations that employ specific terminal protocols (such as ASYNC,HASP,IBM3270) to communicate in CDCNET networks.

DEFINE_TIP TIP_NAME=ASYNCTIP TUP=XXX

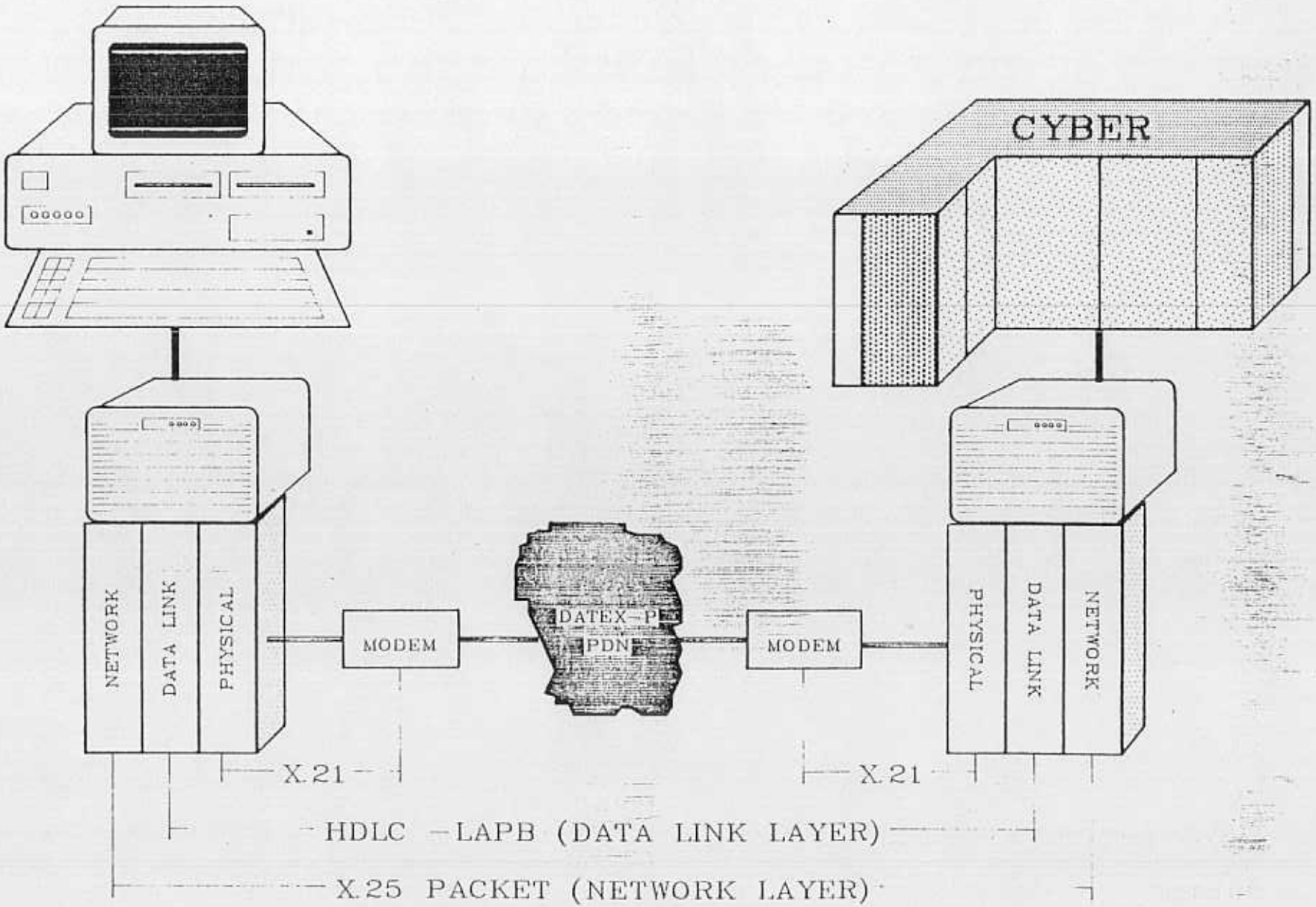


If a TIP is not loaded as part of the DI load process, the first terminal user is likely to encounter a long delay (up to a minute) before the terminal is recognized. To avoid the delay include a load_module command for each TIP configured in a DI.

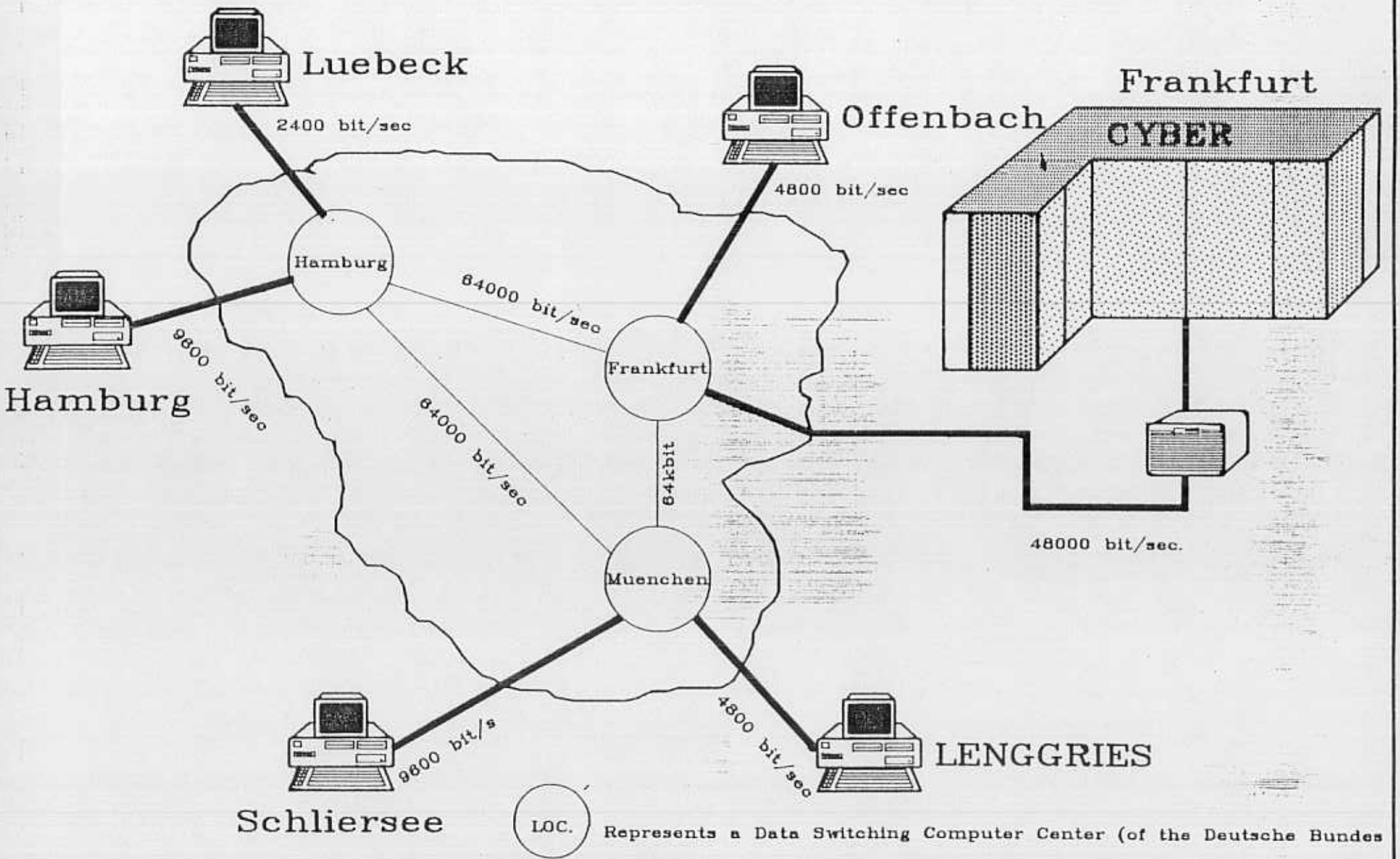
Physical layer bits

Try to decode the HDLC Frame and the Packet in the bottom example.

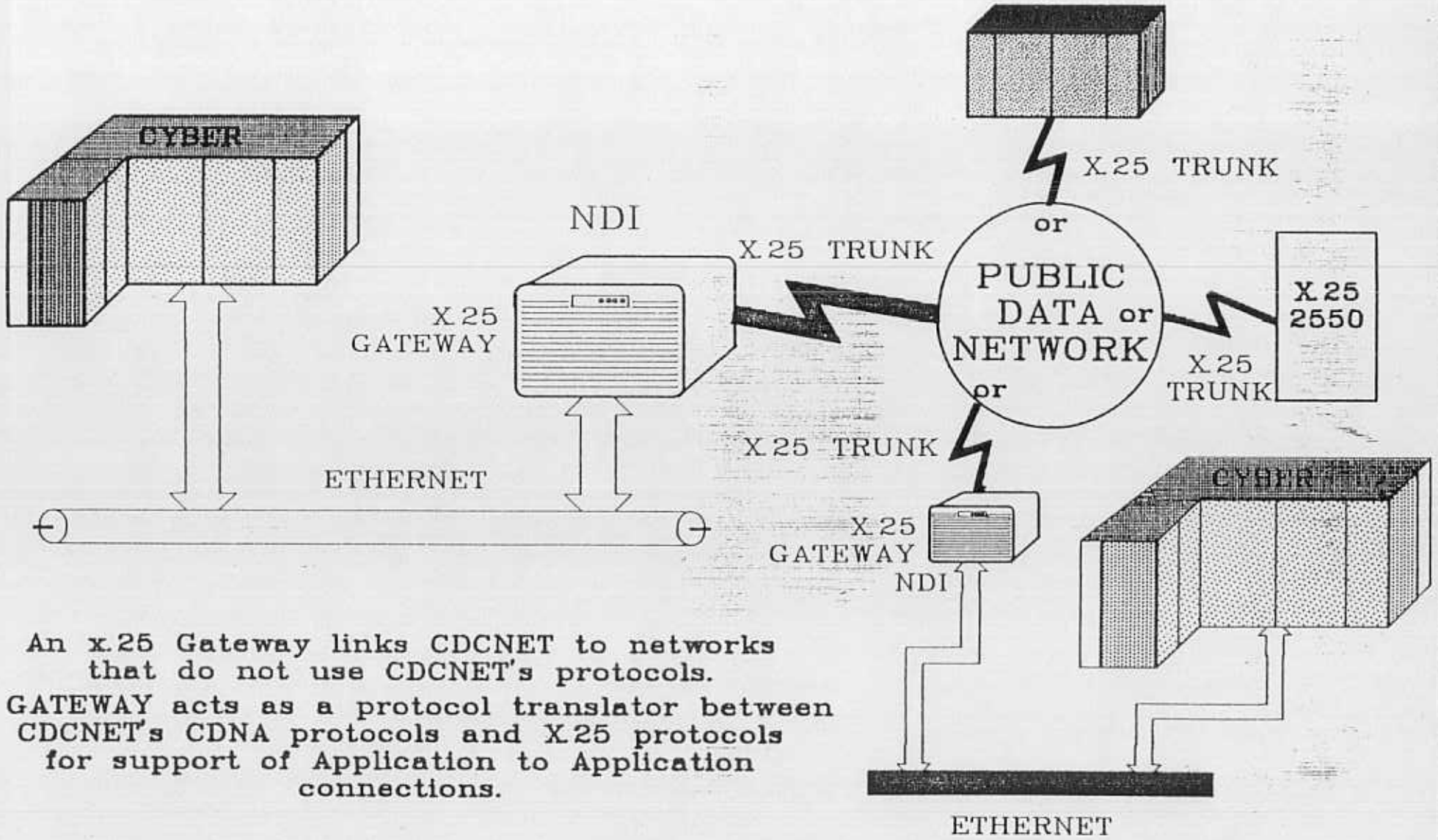
X.25 LAYERS


CYBER
NETWORK
DATA LINK
PHYSICAL
MODEM
DATEX-P
PDN
MODEM
PHYSICAL
DATA LINK
NETWORK
X.21
X.21
HDLC – LAPB (DATA LINK LAYER)
X.25 PACKET (NETWORK LAYER)

Datex-P Connections



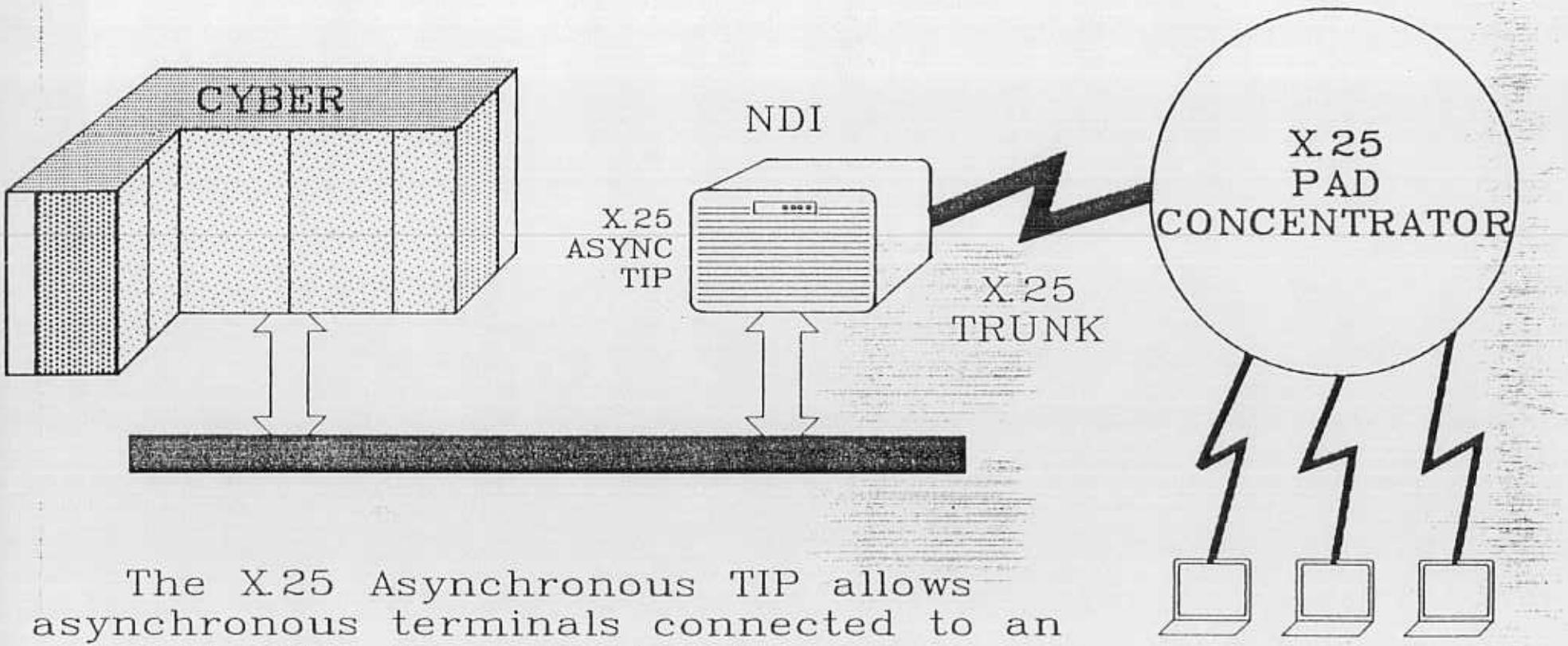
X.25 GATEWAY



An x.25 Gateway links CDCNET to networks that do not use CDCNET's protocols.

A GATEWAY acts as a protocol translator between CDCNET's CDNA protocols and X.25 protocols for support of Application to Application connections.

X.25 INTERFACE ASYNCHRONOUS TIP

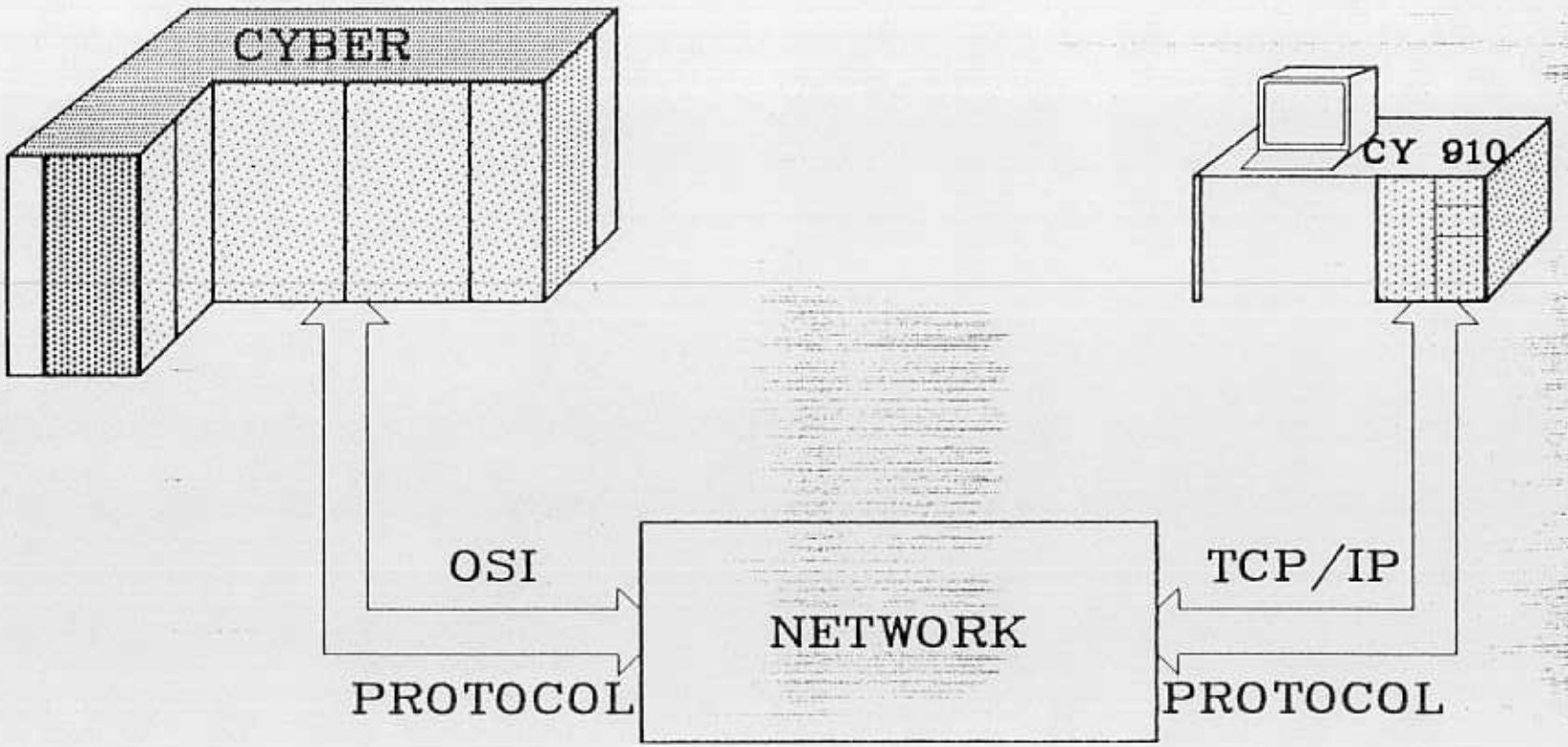


The X.25 Asynchronous TIP allows asynchronous terminals connected to an X.25 PAD Concentrator to access CDCNET.

A Terminal Interface Program (TIP) is software that resides in a DI and enables terminals that employ specific terminal protocols (async,HASP,3270) to communicate in CDCNET networks

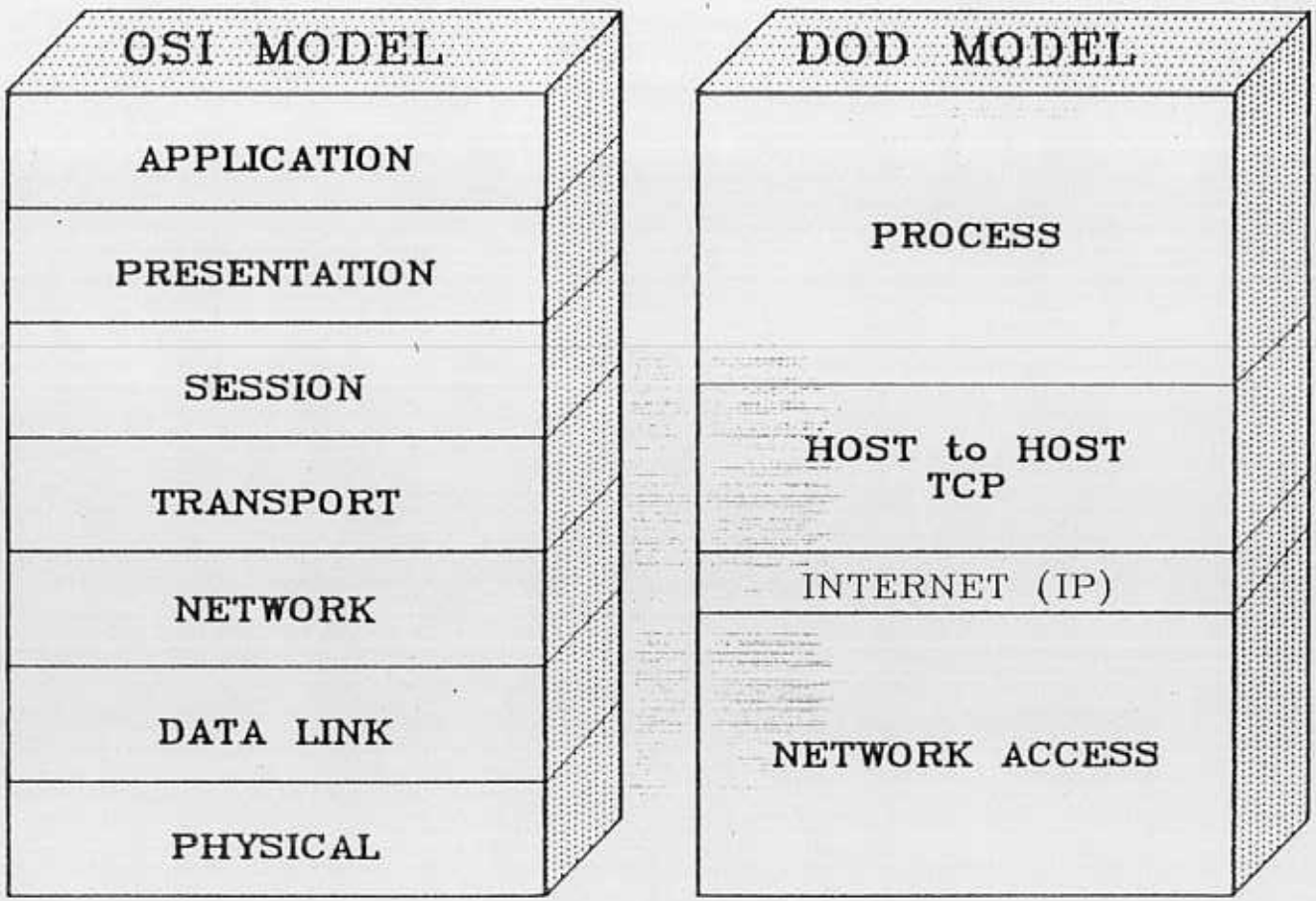
TCP/IP

TCP/IP to CYBER

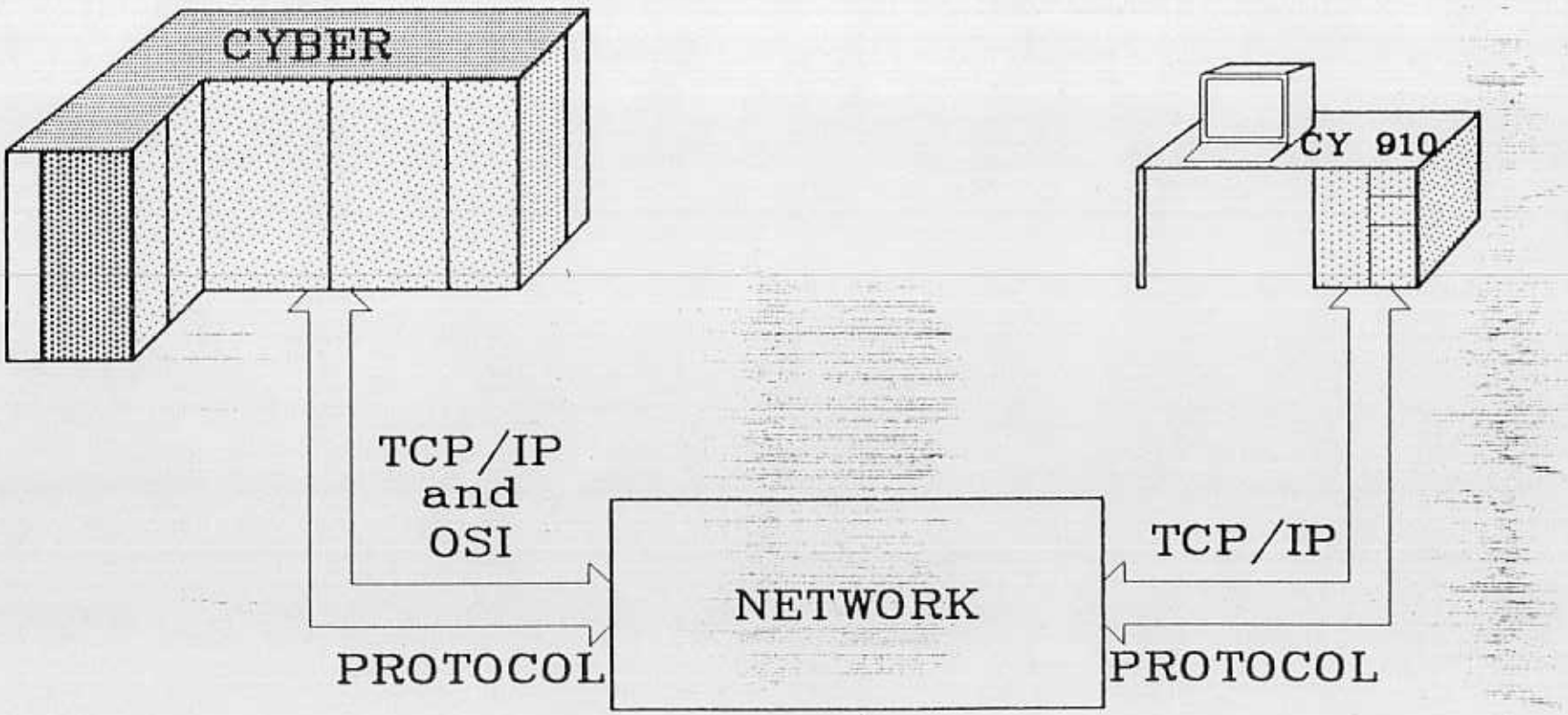


Notice that both hosts are talking to the network with different protocols, one in OSI the other in TCP/IP. Both CYBER and CYBER 910 can't understand the other.

DOD comparison to OSI



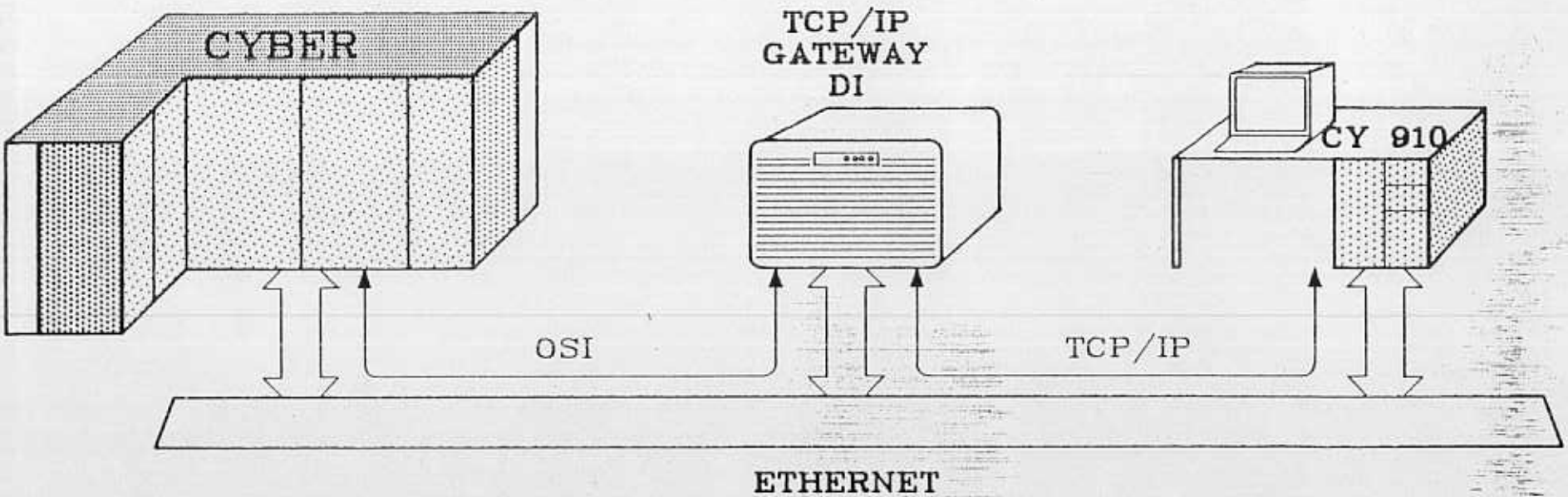
TCP/IP to CYBER



By having defined a TCP/IP GATEWAY the CYBER understands both the TCP/IP and OSI protocol. A GATEWAY is a software interface between systems with different protocols

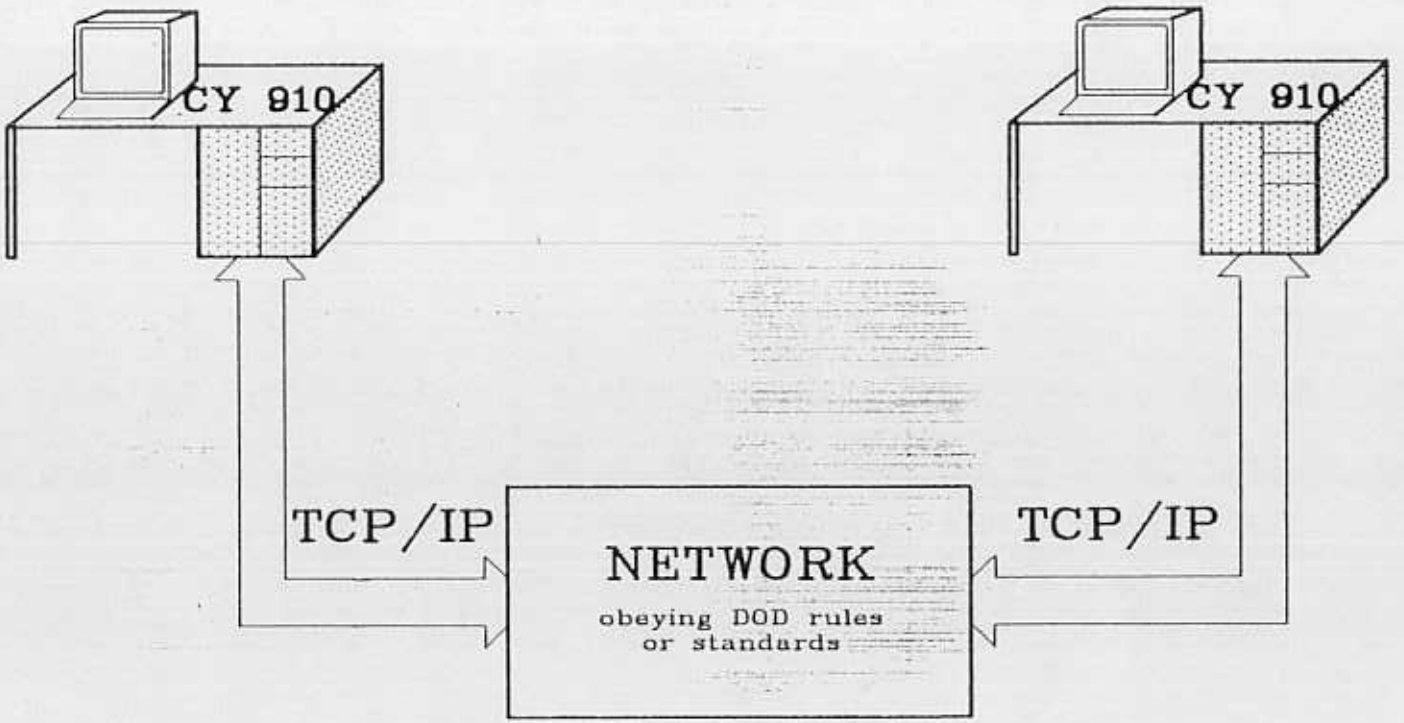
The TCP/IP interface software is contained in a TCP/IP GATEWAY.

TCP/IP GATEWAY



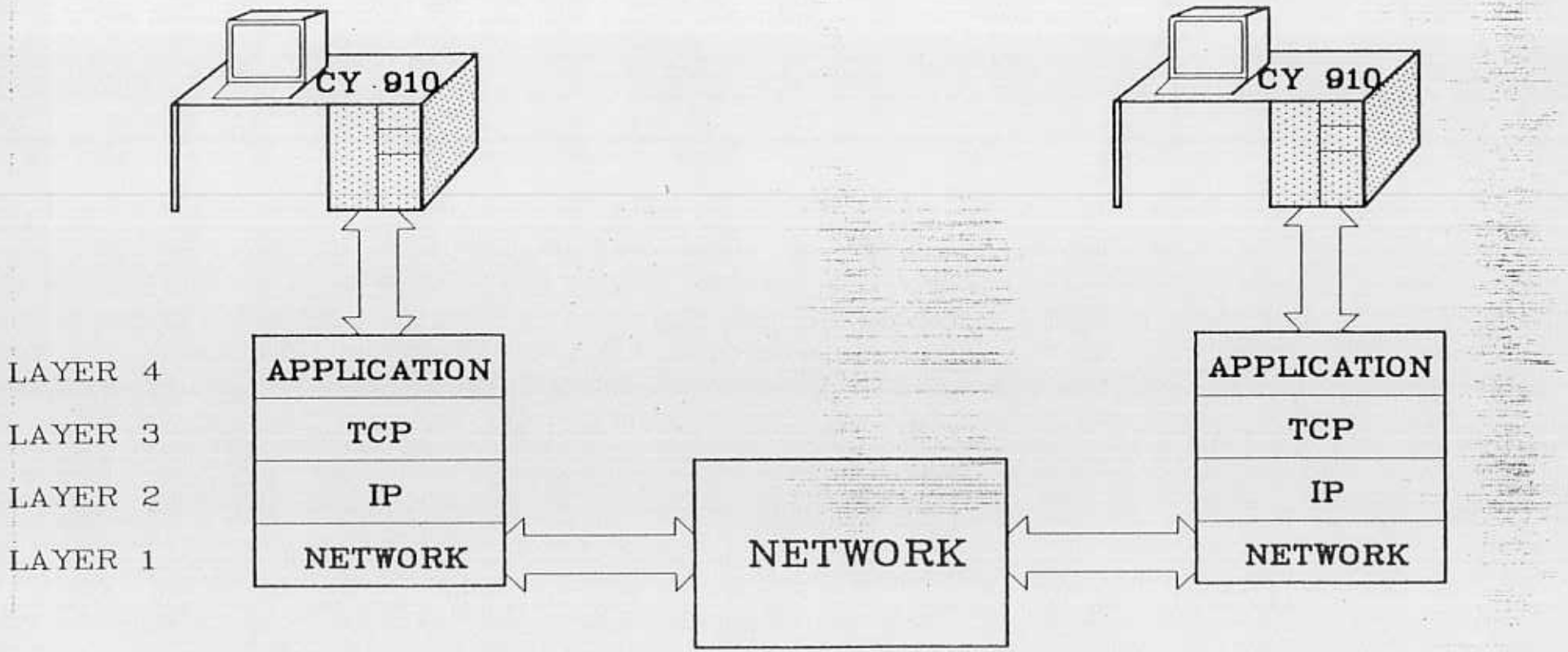
The TCP/IP GATEWAY DI acts as a protocoll tanslator.
It translates TCP/IP protocoll to OSI protocoll.
The connections may be over ETHERNET or X.25

Department of Defense (DOD) communication

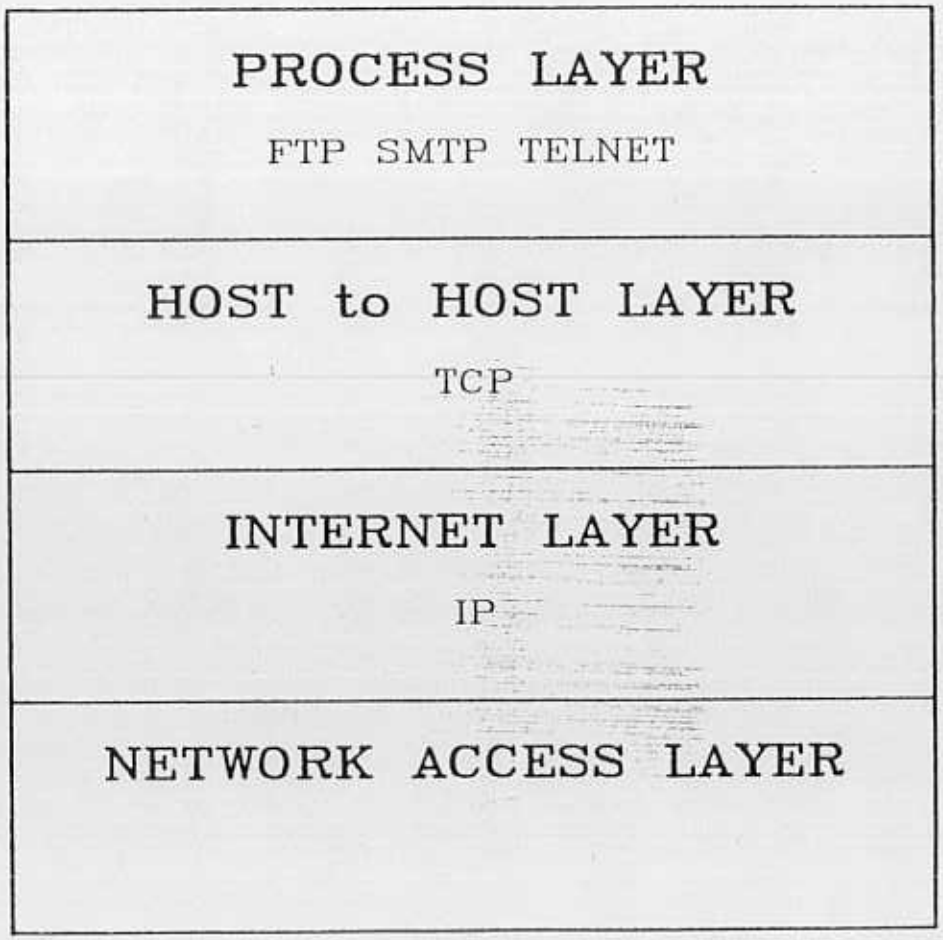


The DOD standard is utilized by both hosts.
This standart is often called TCP/IP which stands for Transmission Control Protocol and Internet Protocol.

Department of Defense (DOD) Military Standard Protocol

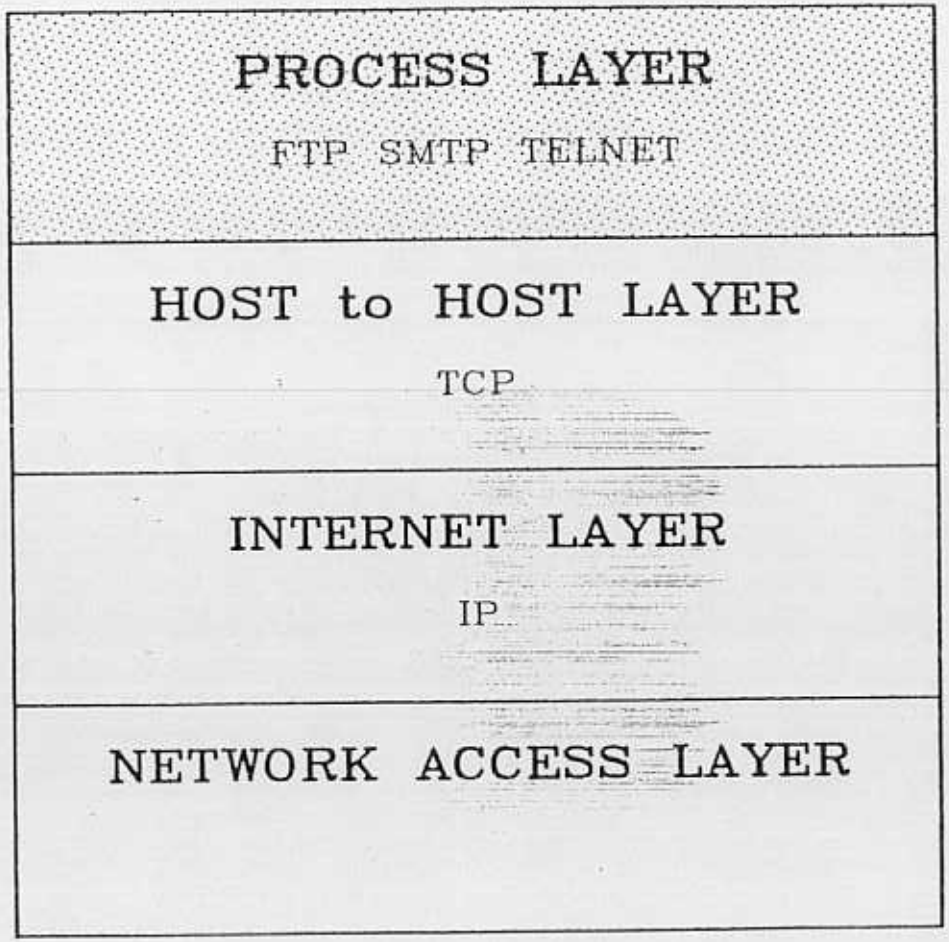


DOD LAYERS



The DOD (TCP/IP) model uses 4 layers instead of 7 layers which are used in the OSi model.

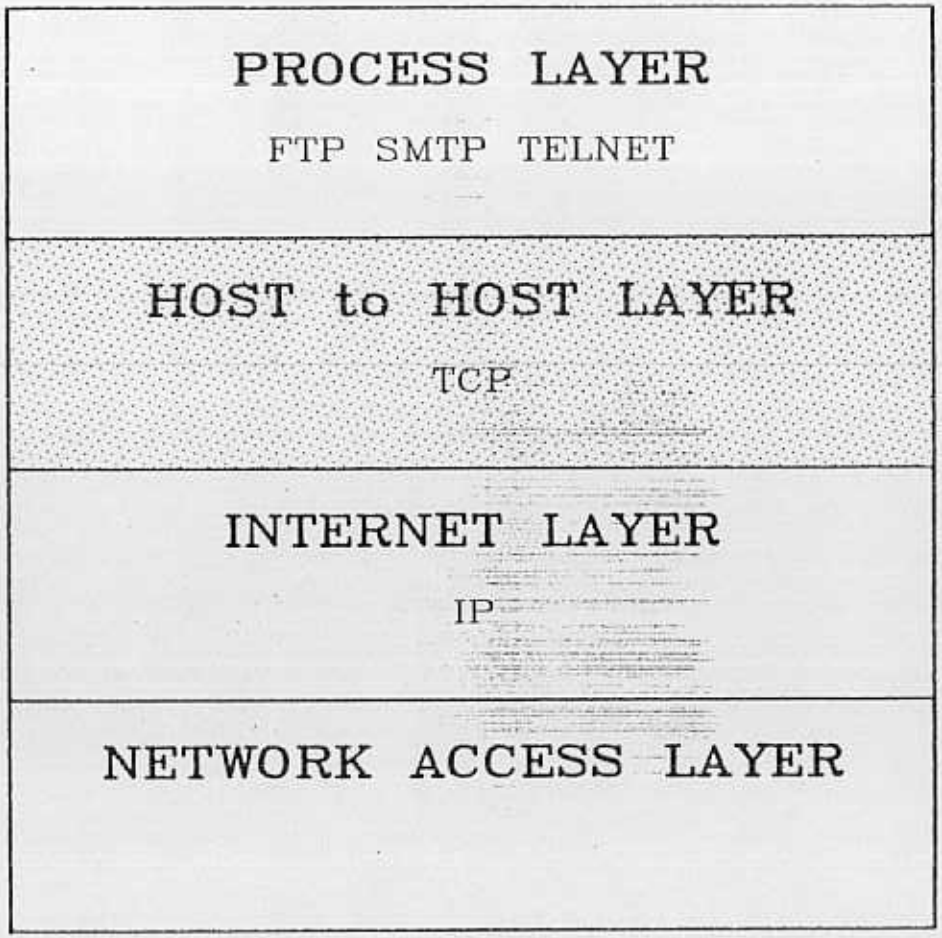
DOD LAYERS



The PROCESS or APPLICATION layer contains the following

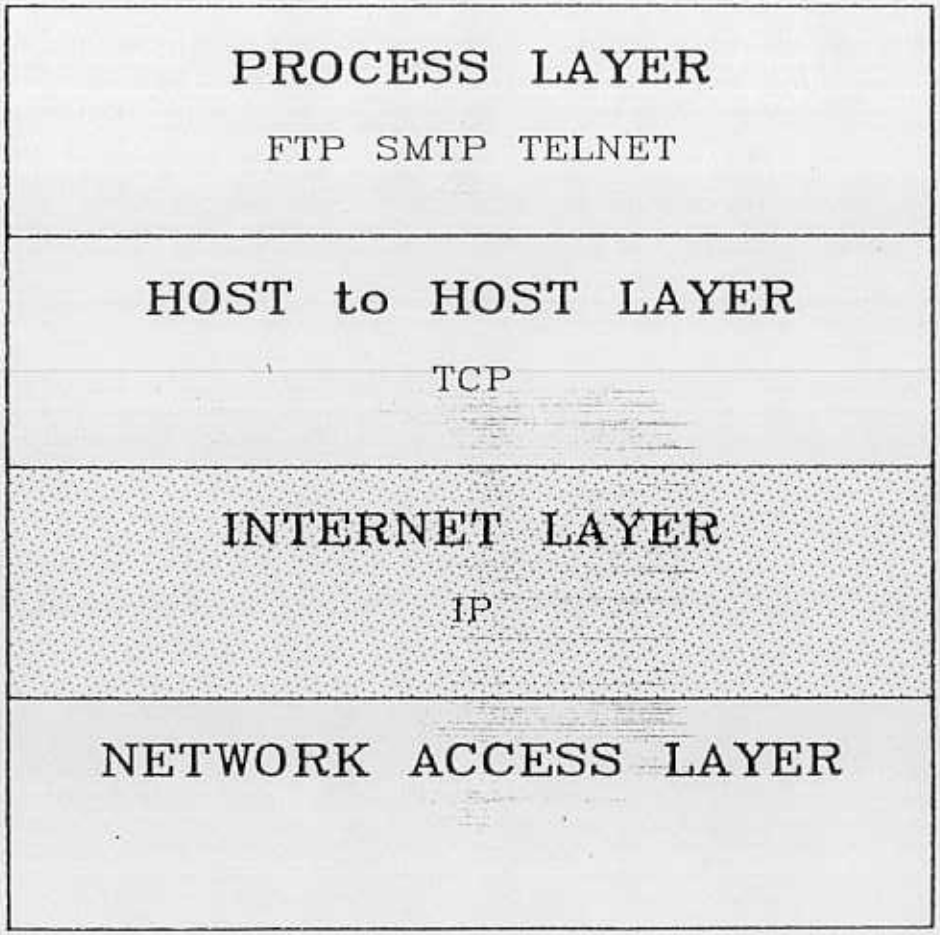
- FTP a simple application to transfer ASCII,EBCDIC, and binary files
- SMTP a simple electronic mail facility
- TELNET a simple scroll – mode terminal capability

DOD LAYERS



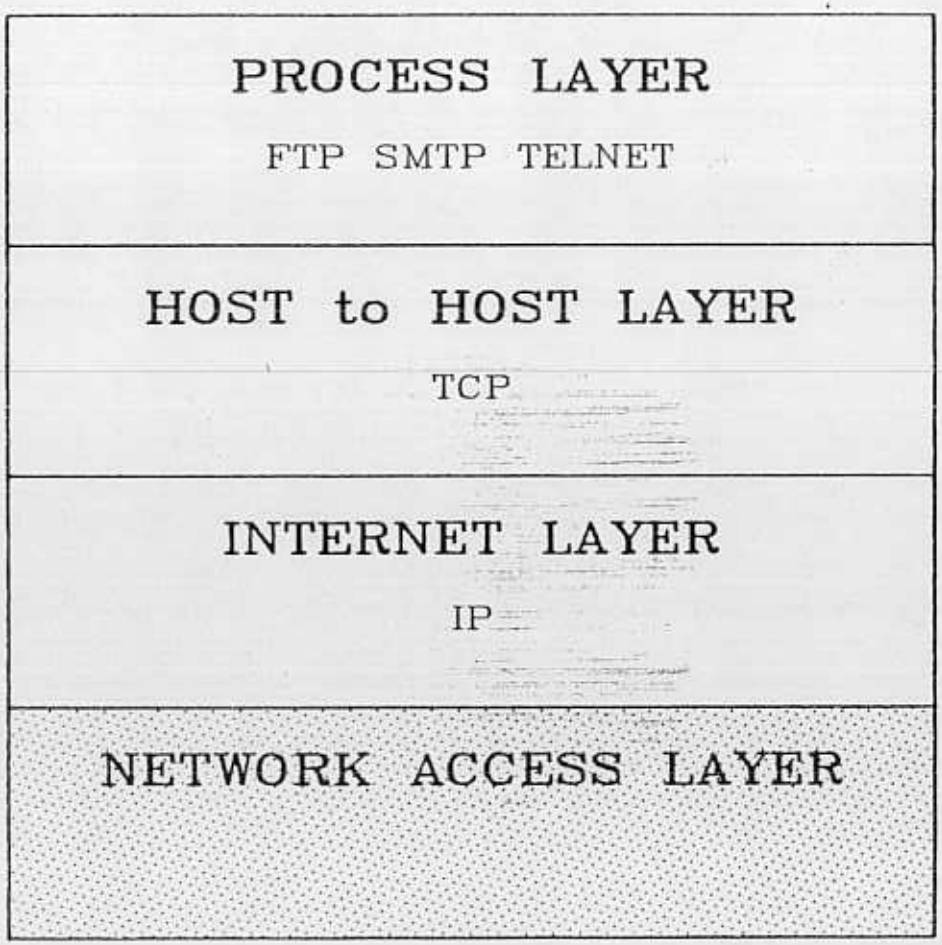
The HOST to HOST LAYER (TCP) provides a reliable end – to – end data transfer service.
It ensures that data is delivered error free, in sequence, with no loss or duplication.

DOD LAYERS



Provides a connectionless service for end systems to comunicate across one or more networks. Does not assume the network to be reliable.

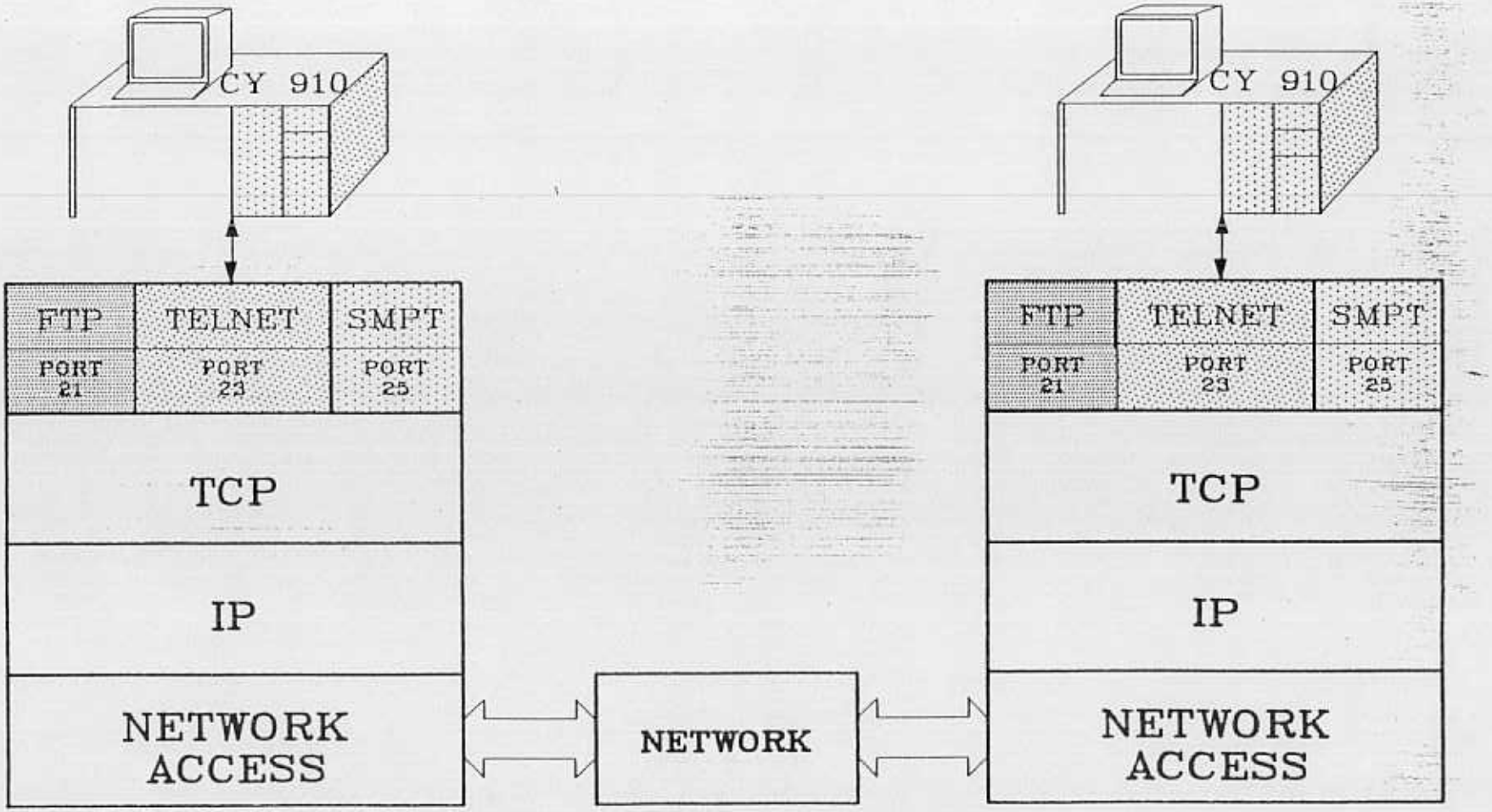
DOD LAYERS



The NETWORK ACCESS LAYER is concerned with routing data between two devices attached to the same network. The sending host must provide the network with the address of the destination host, so that the network may route the data appropriately. INTERNET LAYER is used to provide the routing function across multiple networks.

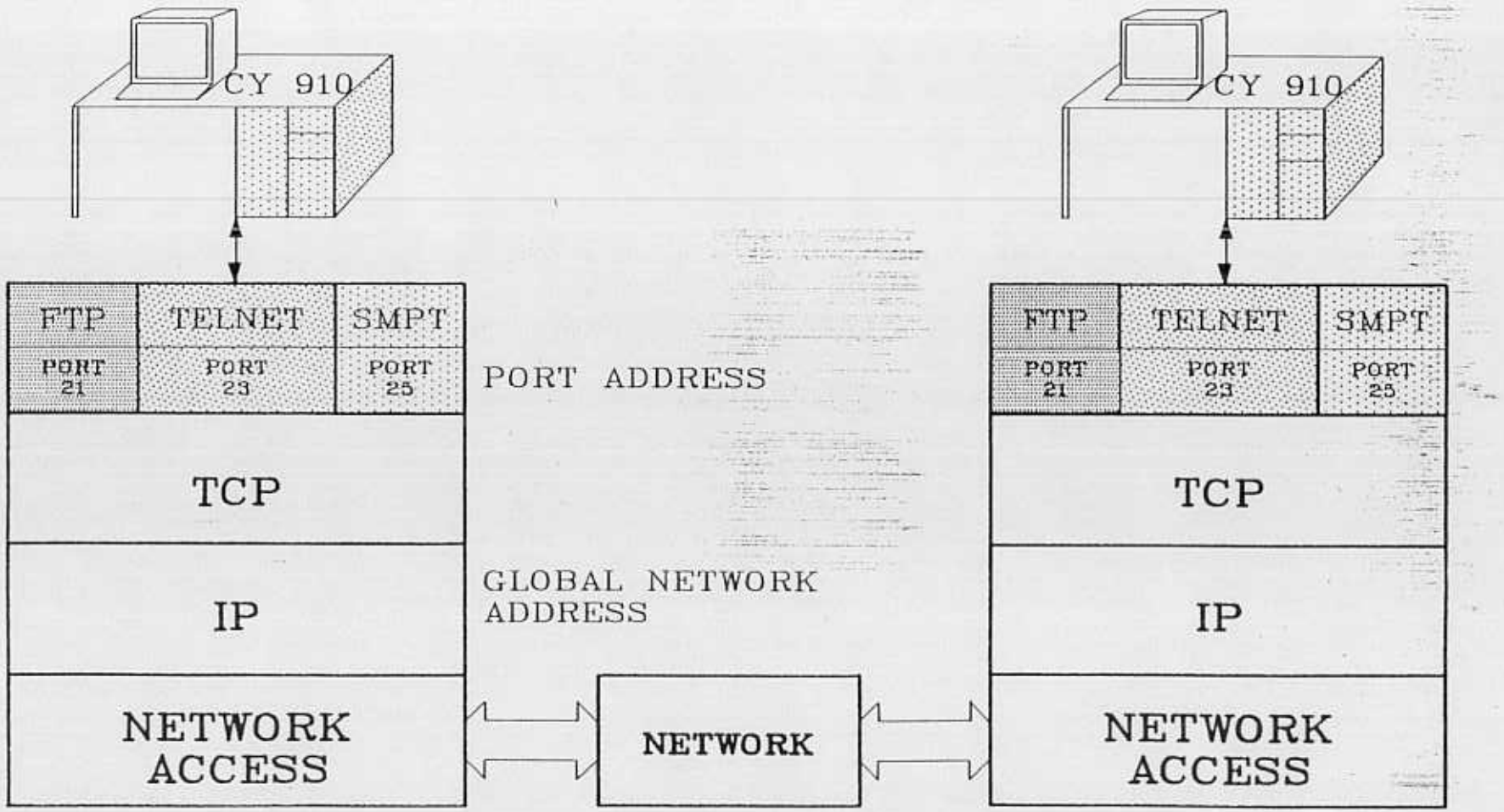
APPLICATION PORTS

Each application (process) within the host must have an address that is unique within the host,this allows the HOST to HOST protocol (TCP) to deliver data to the proper process (application).

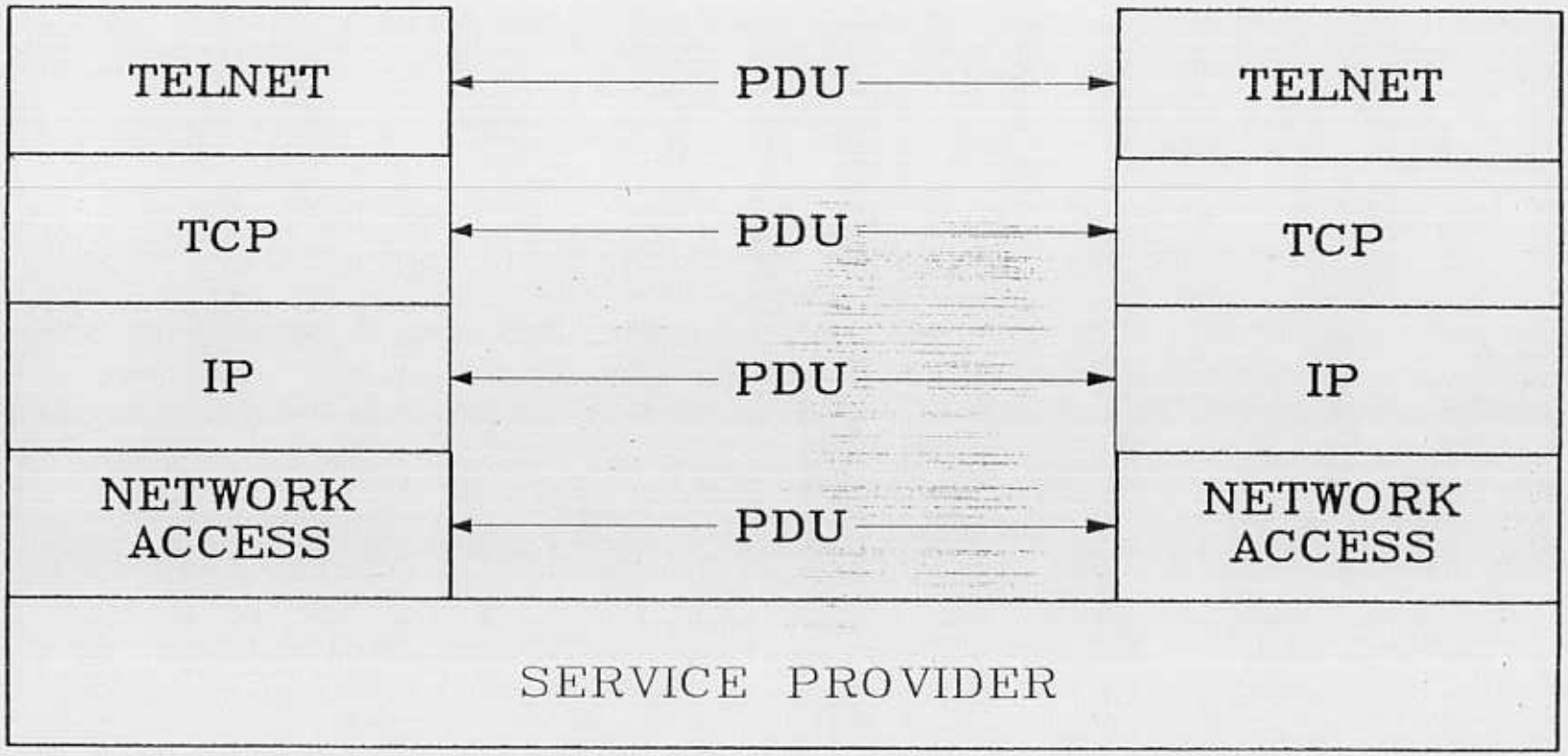


GLOBAL NETWORK ADDRESS

Each host on the network has a unique global network address; this allows the data to be delivered to the proper host. Actually, two levels of addressing are needed. A unique GLOBAL ADDRESS and a PORT ADDRESS

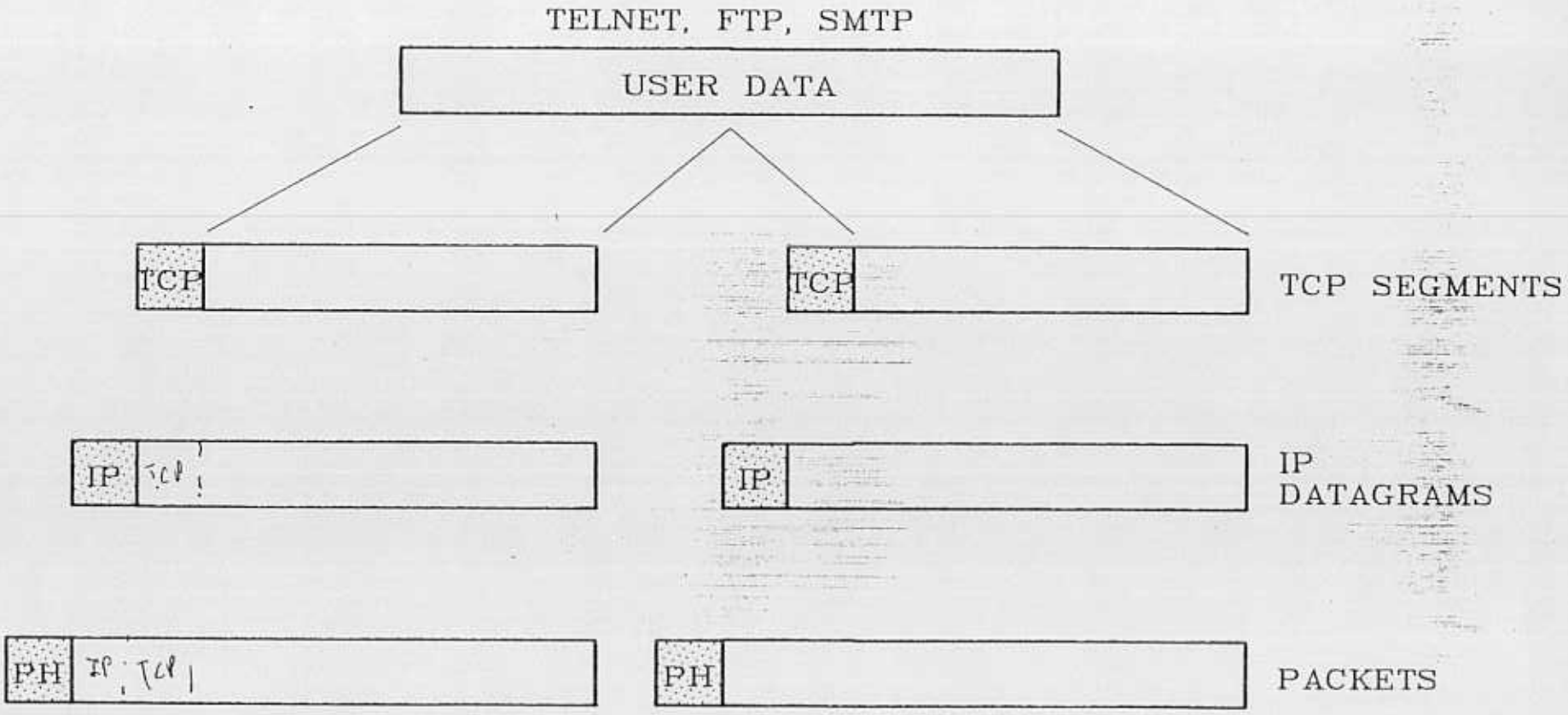


User data and protocol control information



PDU (Protocol Data Unit) acts as a message exchange between peer (like) layer. It contains the header and the data.

User data and protocol control information

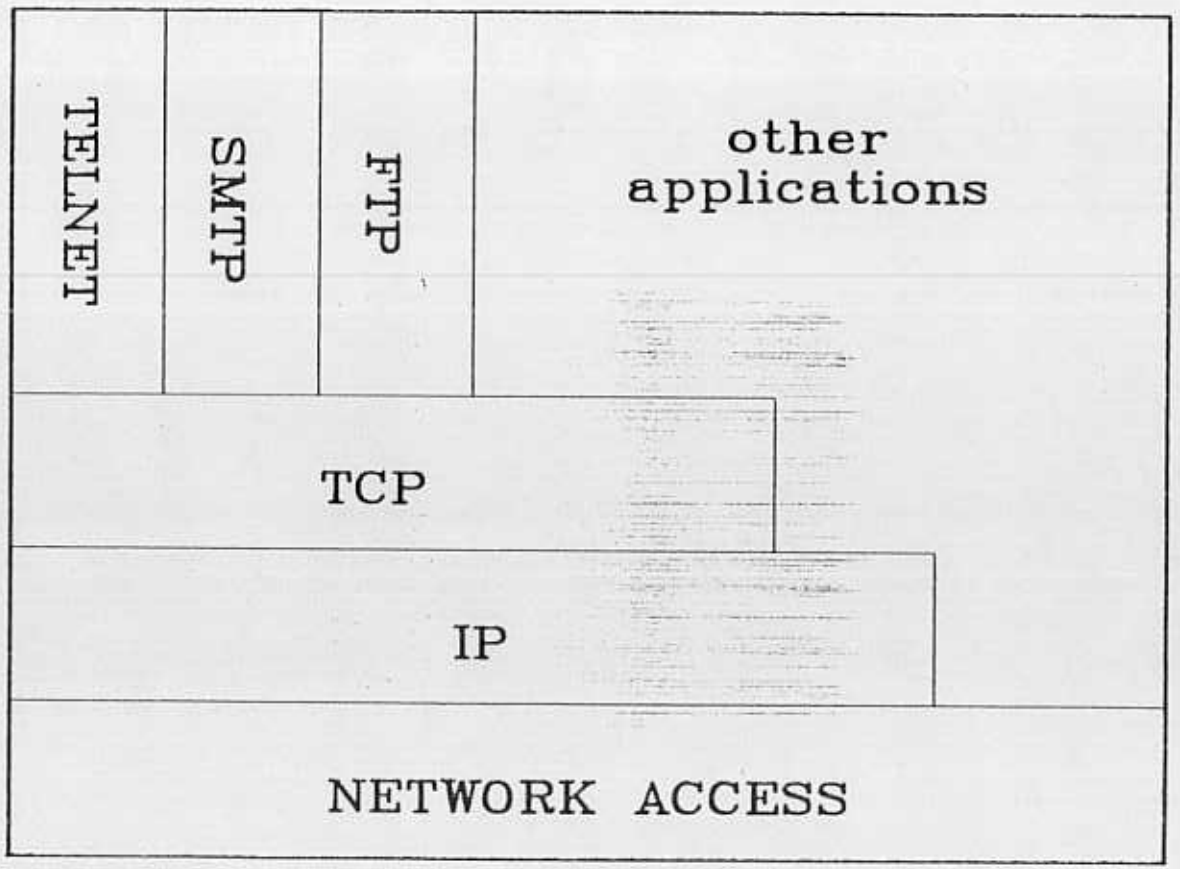


TCP DESTINATION PORT, SEQUENCE NUMBER, CHECKSUM

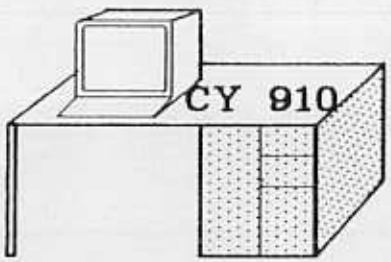
IP SOURCE and DESTINATION adr., DATA LENGTH ect.

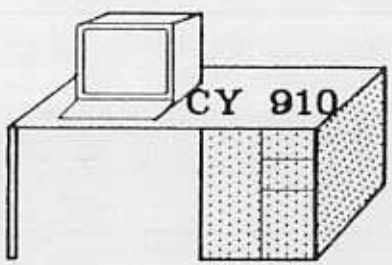
PH DESTINATION SUBNETWORK adr. ect.

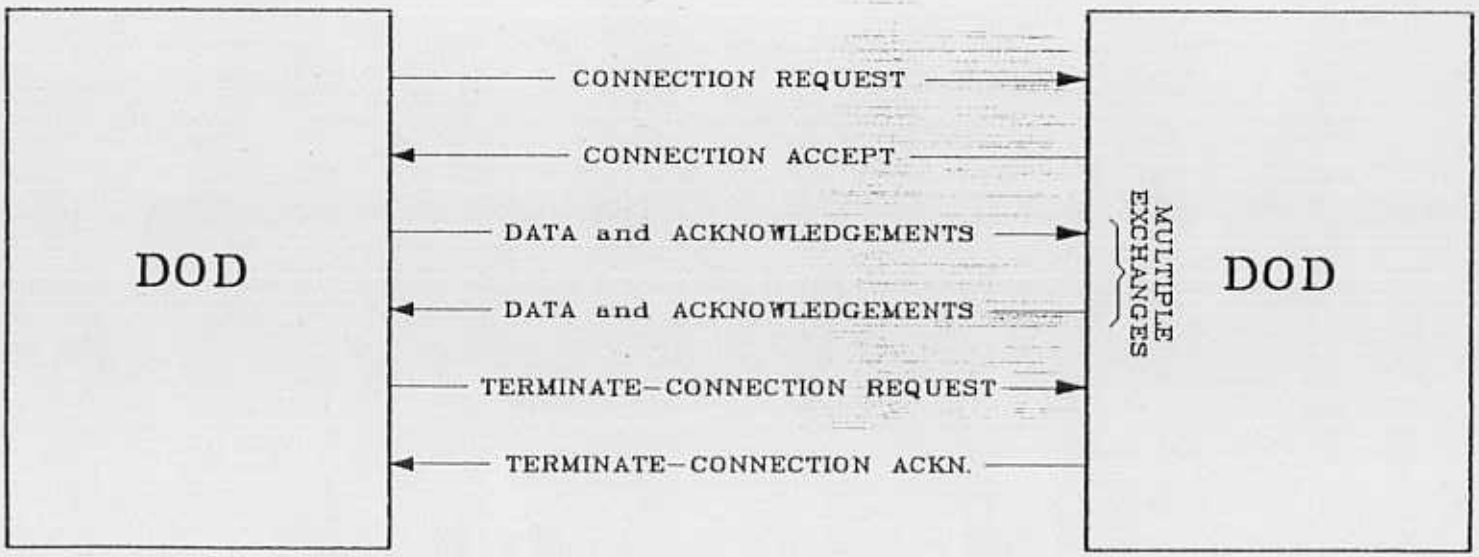
DOD protocol interfaces



CONNECTION ORIENTED DATA TRANSFER

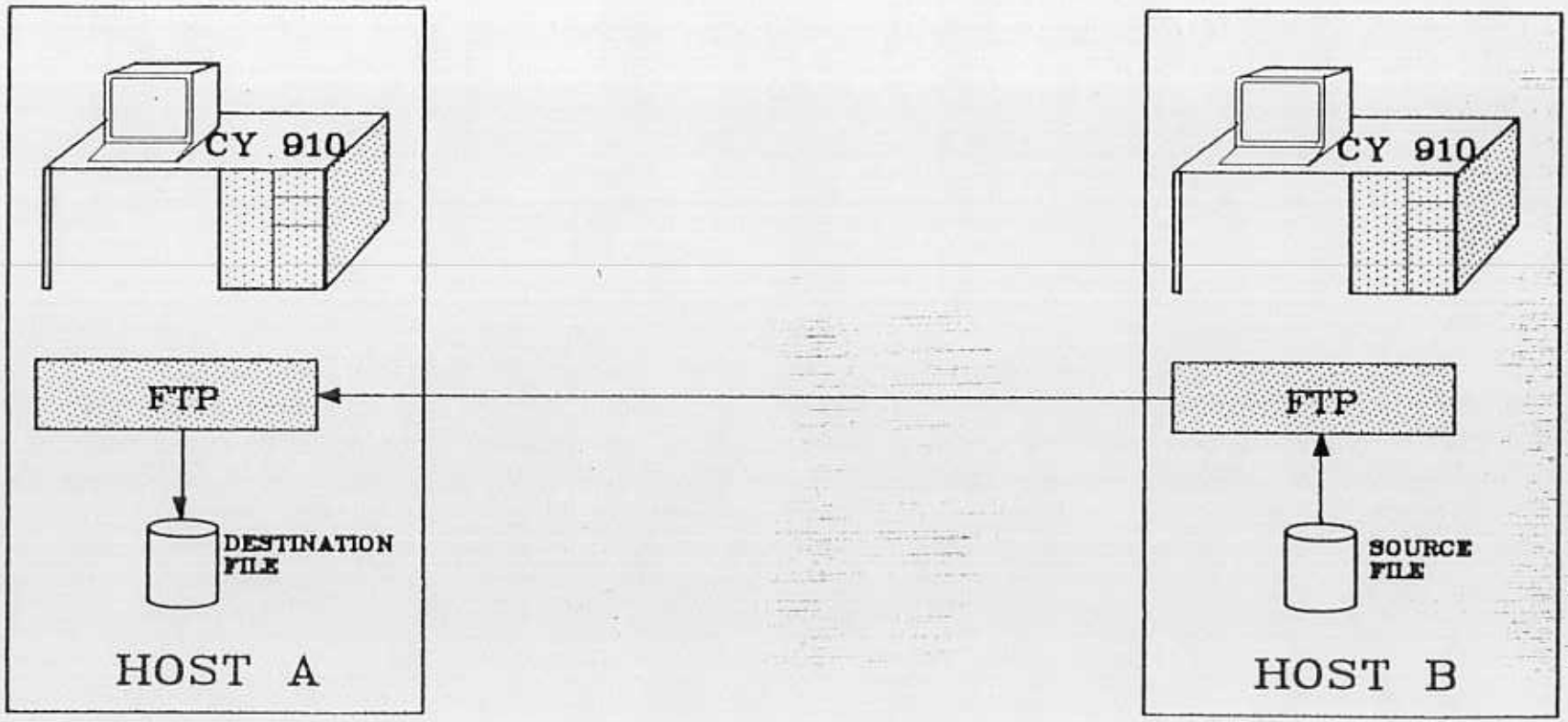






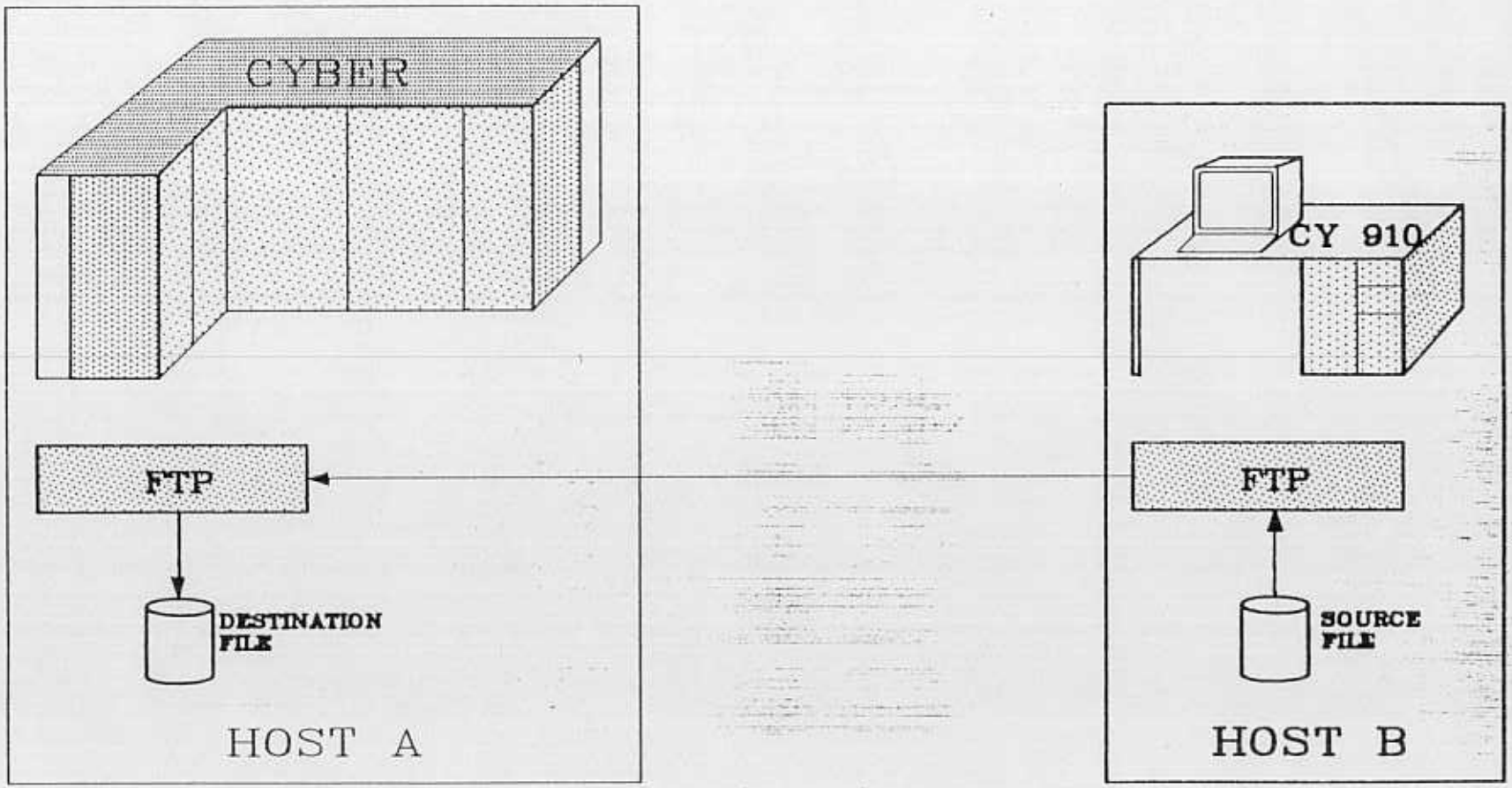
TCP is connection oriented to support reliable data transfer. FTP, SMTP, TELNET make all use of TCP, thus they are connection – oriented.

FILE TRANSFER PROTOCOL
FTP



FTP is used to support immediate (real time) file movement. The initiator of the transfer can either be human or a computer program. The initiator must wait until the file transfer is complete before proceeding with other activities.

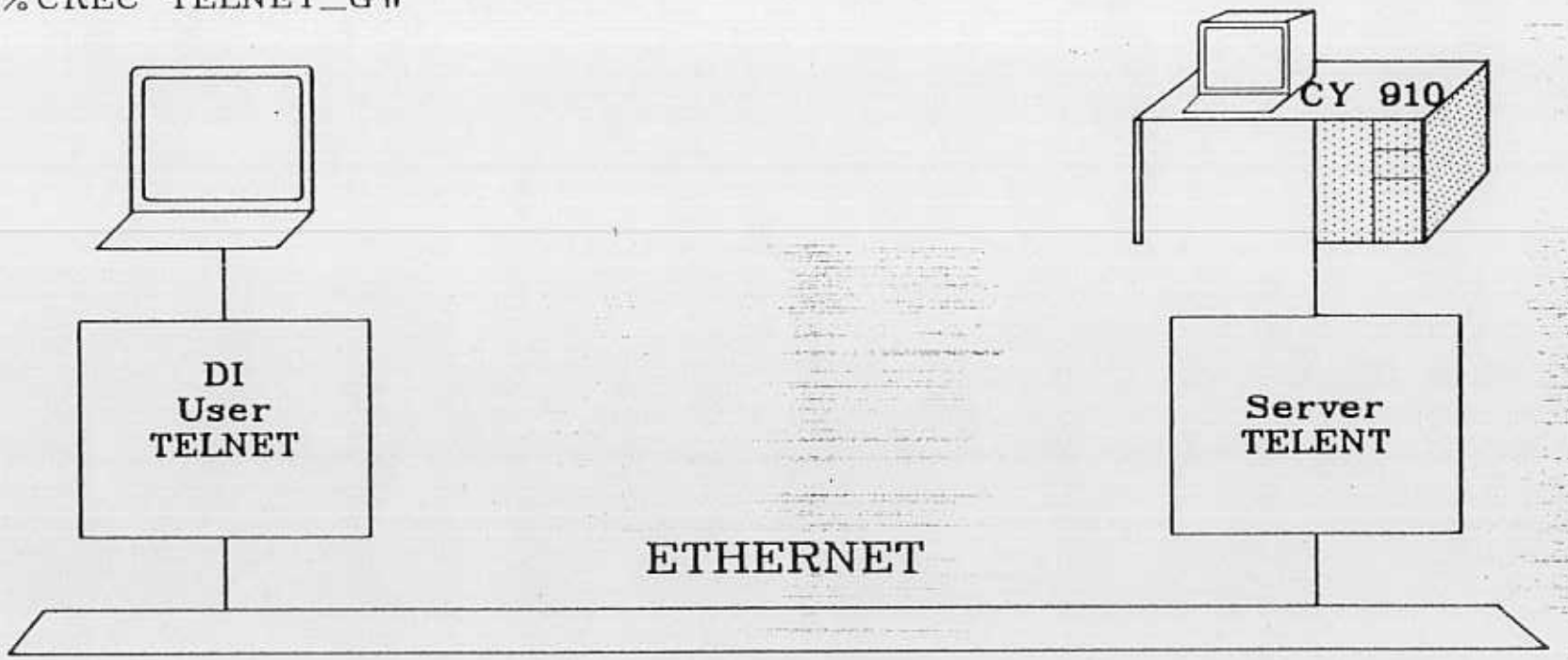
FILE TRANSFER PROTOCOL



FTP is used to support immediate (real time) file movement. The initiator of the transfer can either be human or a computer program. The initiator must wait until the file transfer is complete before proceeding with other activities.

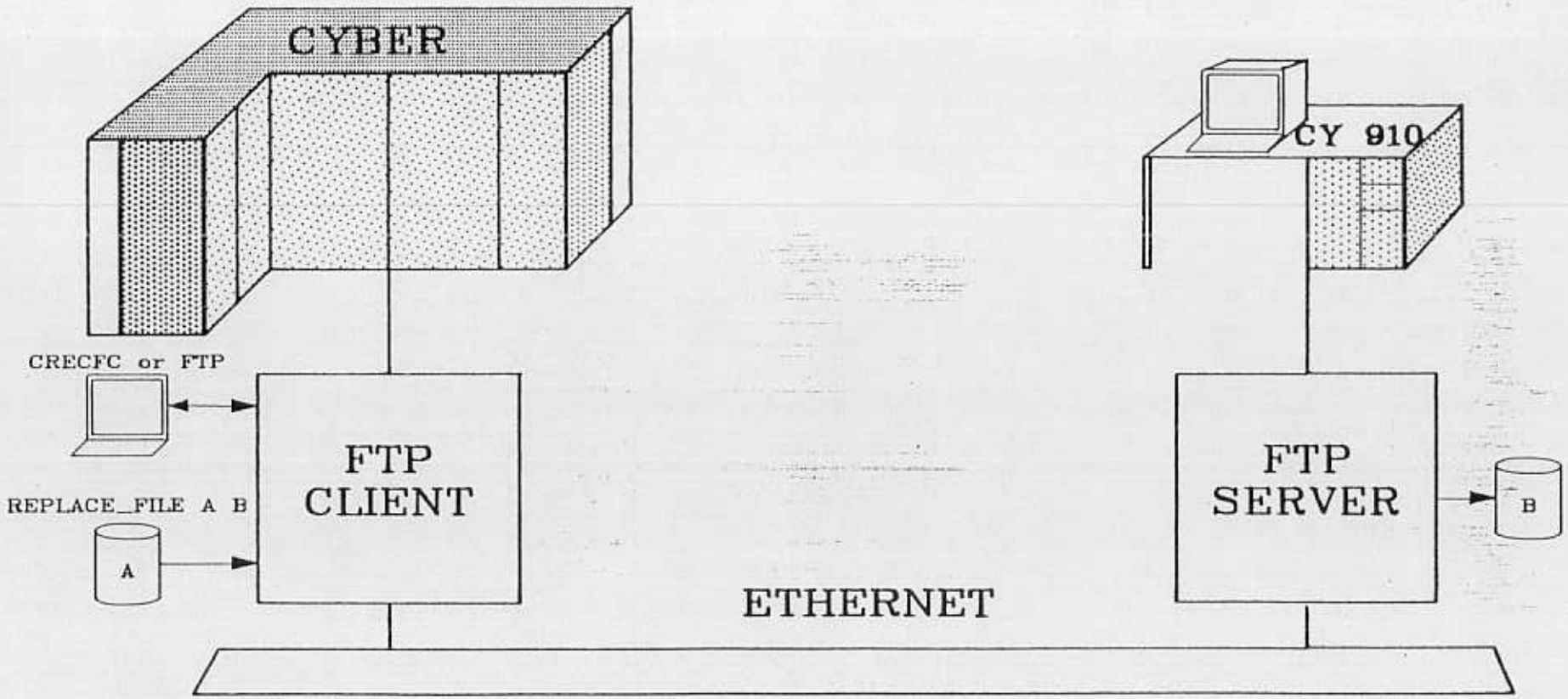
CDCNET with TELNET CDCNET user

%CREC TELNET_GW SD='129.168.3.20'
%CREC TELNET_GW



A CDCNET user TELNET connection connects a CDCNET terminal to a Server TELNET host (910).
The CREATE_CONNECTION command initiates a User TELNET connection. You specify the title of a Server TELNET host or a User TELNET gateway and and an internet address with the service_data parameter on this command

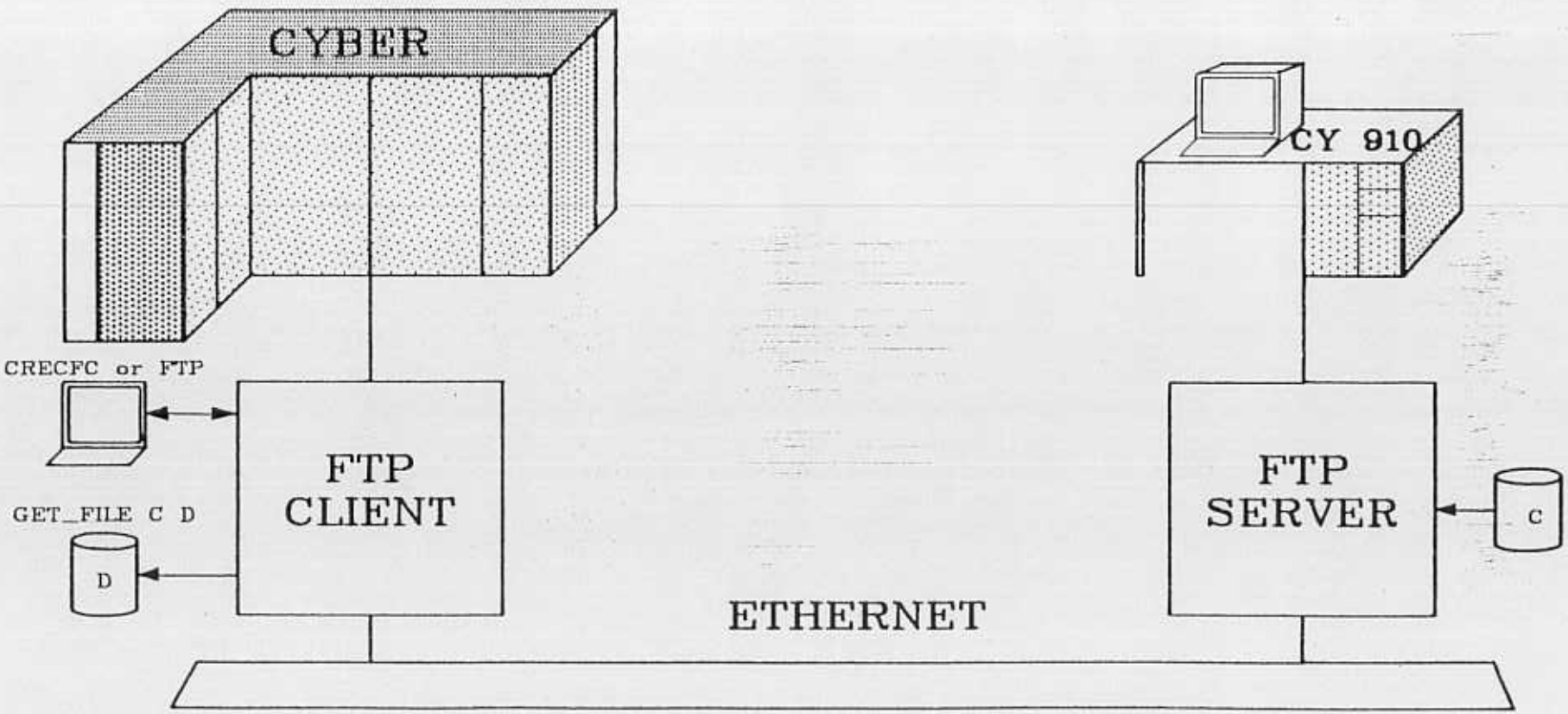
File Transfer Protocol (FTP)
CYBER to 910



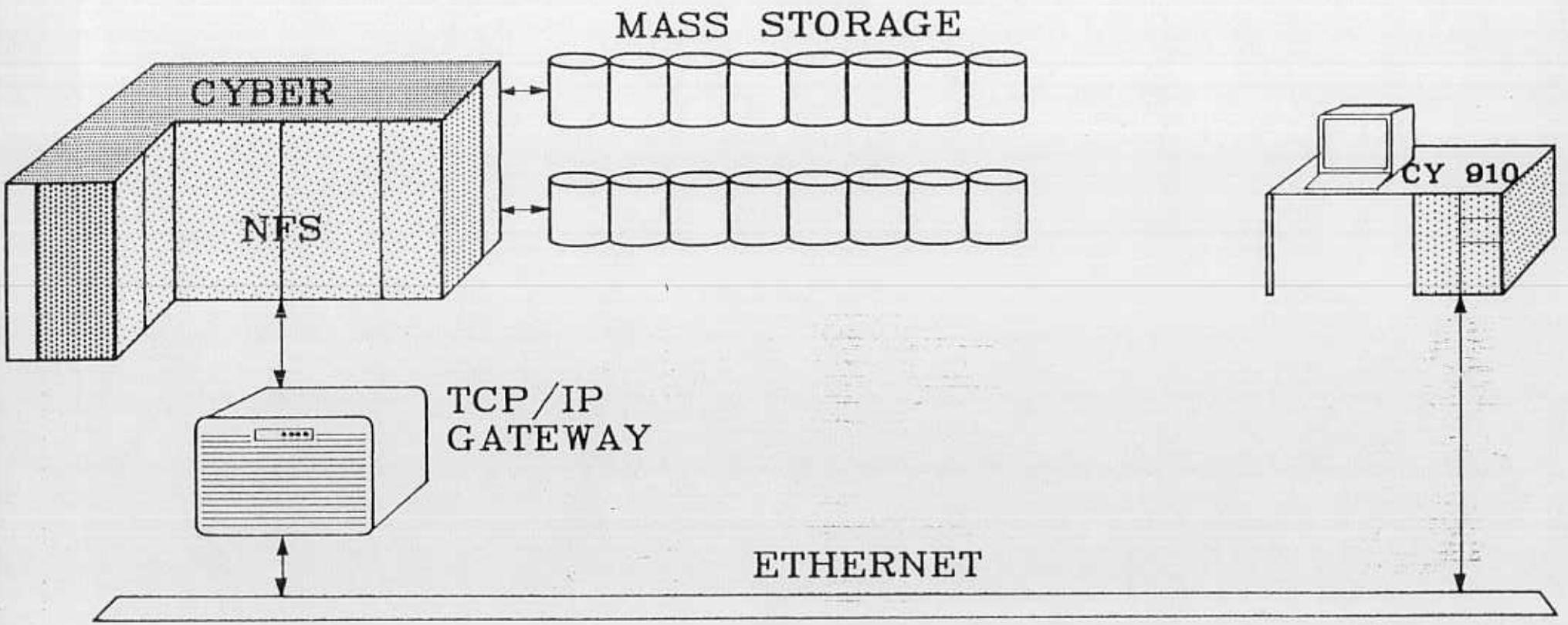
FTP provides file transfer capabilities to and from connected TCP/IP hosts. To access the FTP Client, use the CREATE_CLIENT_FTP_CONNECTION utility, which provides about 35 subcommands.

File Transfer Protocol (FTP)

910 to CYBER



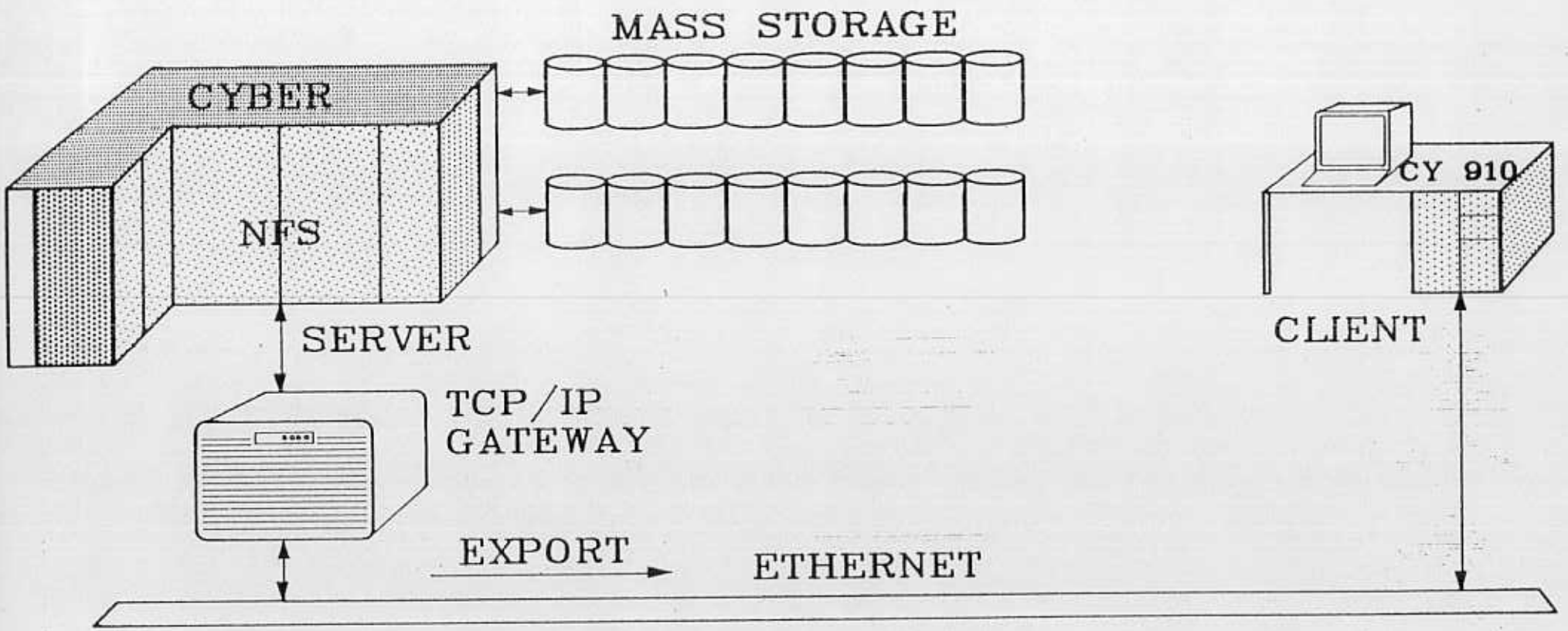
Network File System (NFS)



NFS is an interface software that allows a variety of machines and operating systems to share files. It enables workstations and PC's, called CLIENT systems, to access portions of the NOS/VE file system through CDCNET.

It allows working with files without copying them like PTF.

Network File System (NFS)



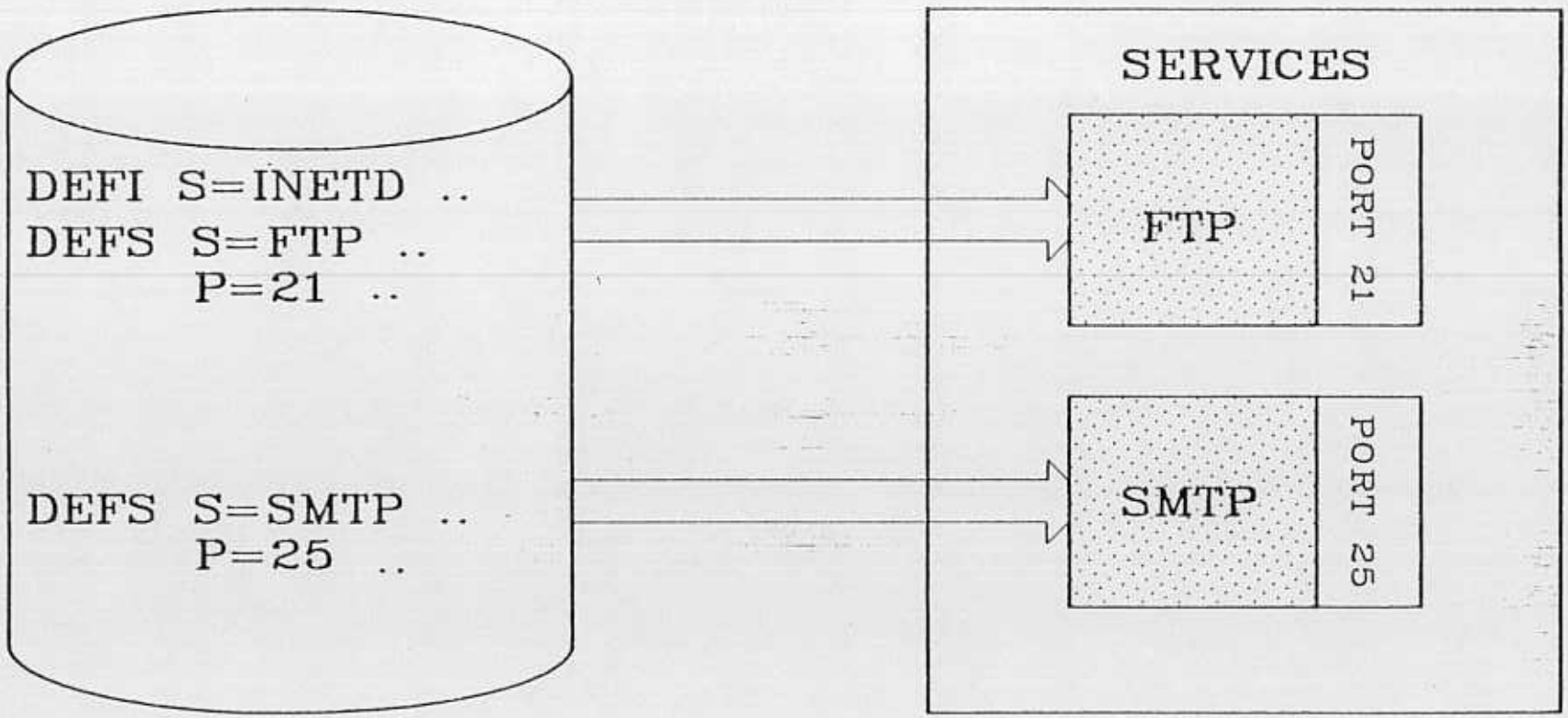
EXPORT – makes a file available to the CLIENT (910) via a MOUNT command issued on the CLIENT

MOUNT – The MOUNT command attaches the file into the local file system at a specific mount point.

a Mount Point is a directory that has been created to receive an exported file system. These files can then be used like any other

INETD CONFIGURATION

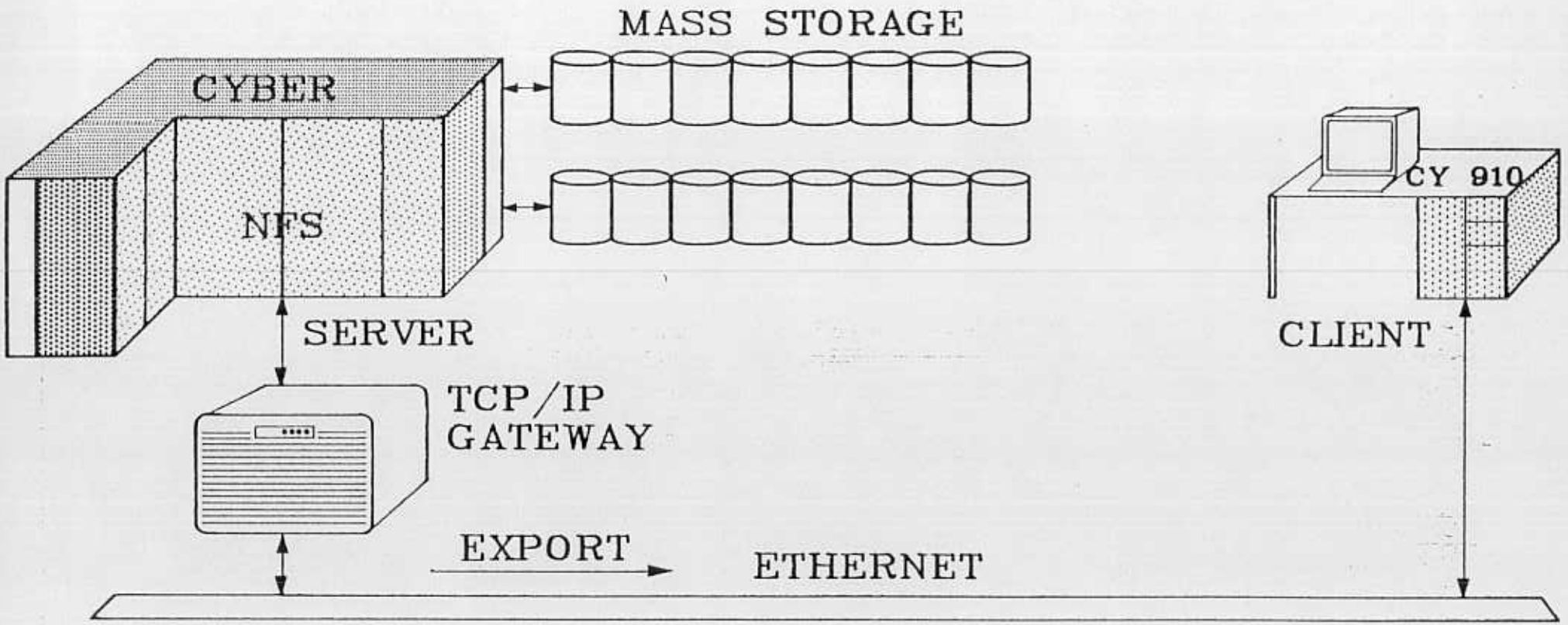
$SYSTEM.TCP_IP.INETD_CONFIGURATION



Defines INETD and the SERVICES that INETD controls. It contains two commands.

DEFINE_INETD – defines the INETD applications
DEFINE_SERVICES – creates an entry for each service that INETD controls

Network File System (NFS)

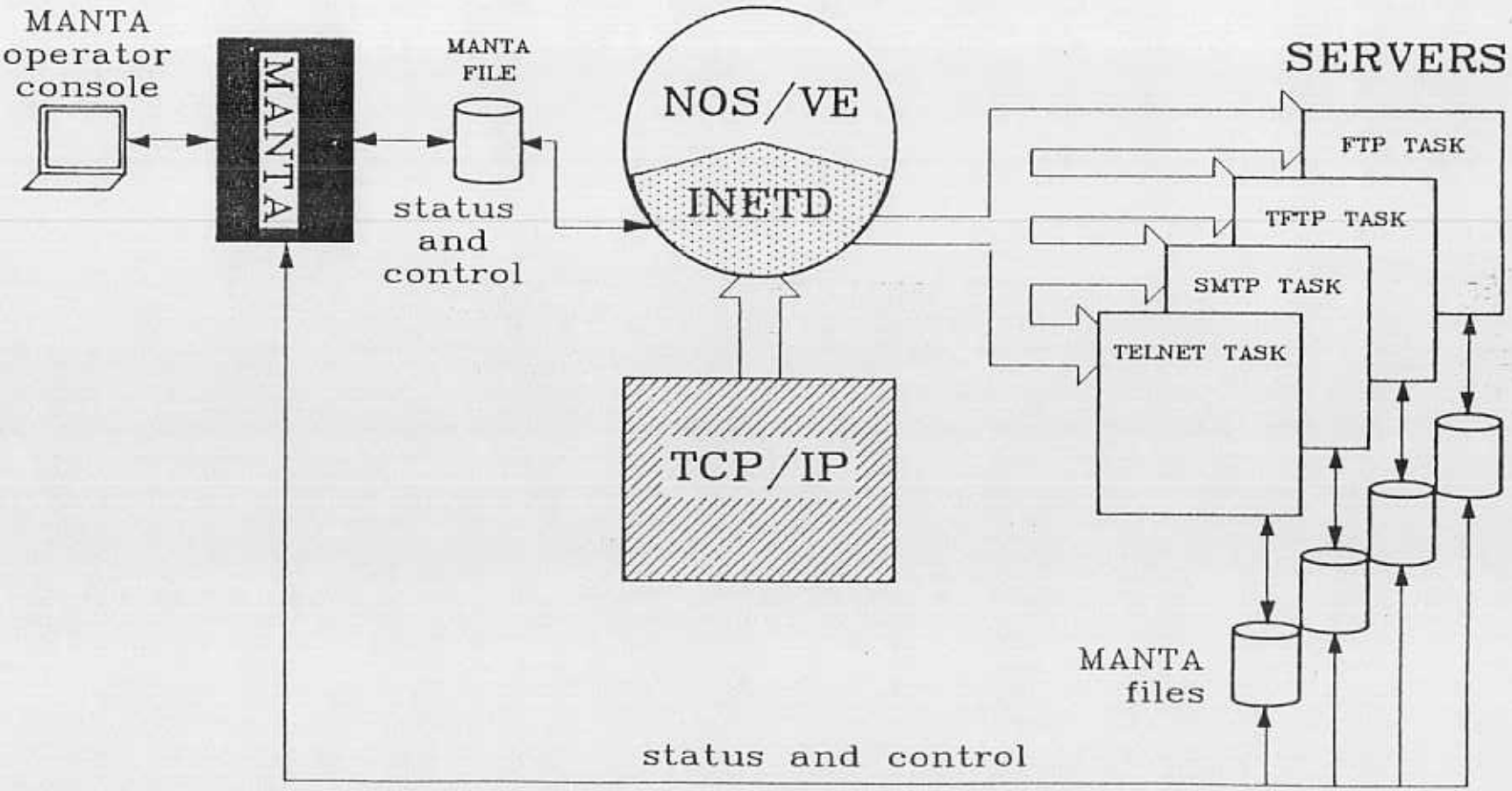


MOUNT CYBER1: /TRAINING/PEDERSON/TEXT /USR/MOUNTPT

name of SERVER NOS/VE host	NOS/VE family	NOS/VE user catalog and user name	NOS/VE sub cat.	mount point the directory which receives the exported files

INETD

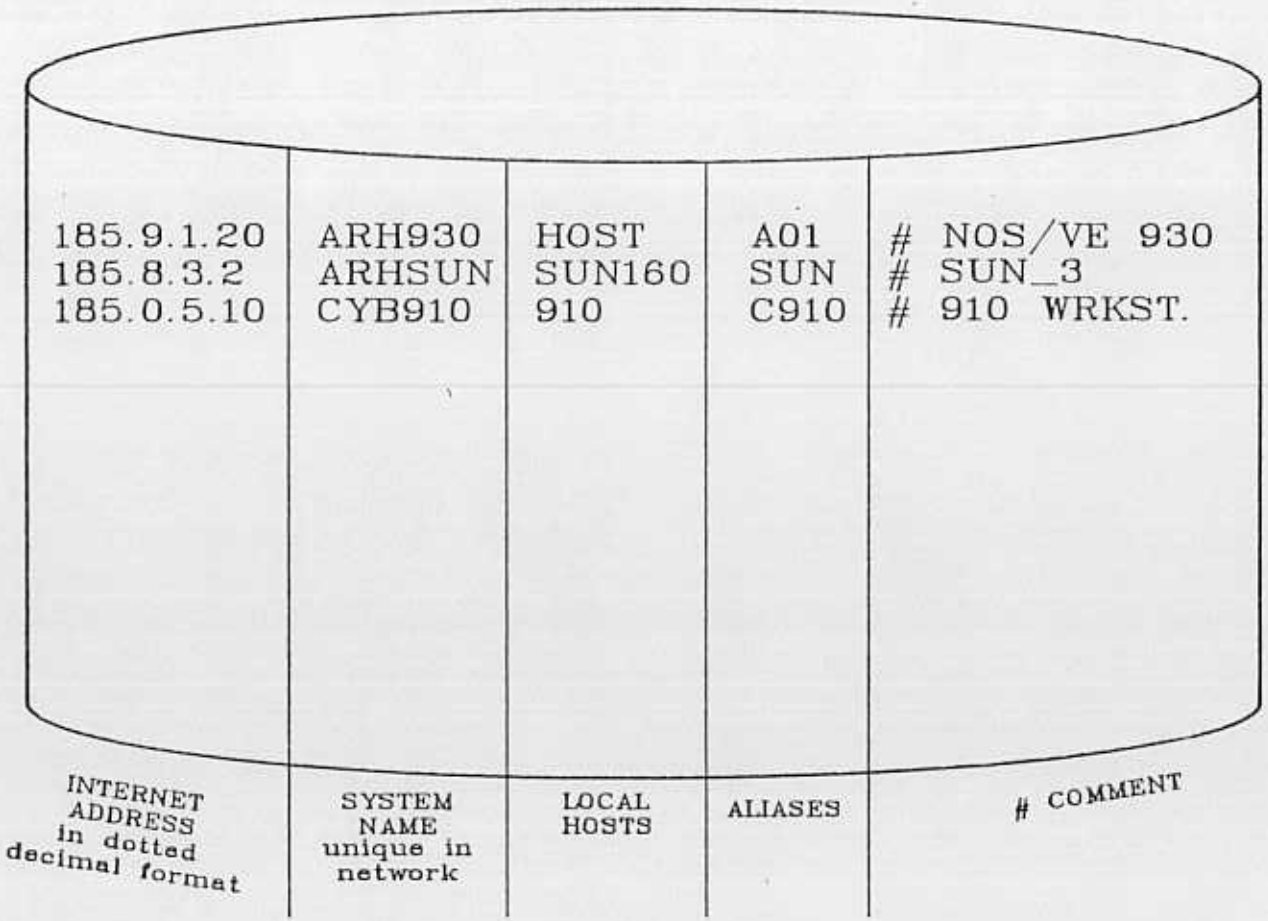
MANTA monitors and controls INETD and the SERVERS via the manta files which have been defined in the configuration



INETD monitors for TCP connections and UDP packets which will be taken care of in the server tasks.

TCP/IP HOST FILE

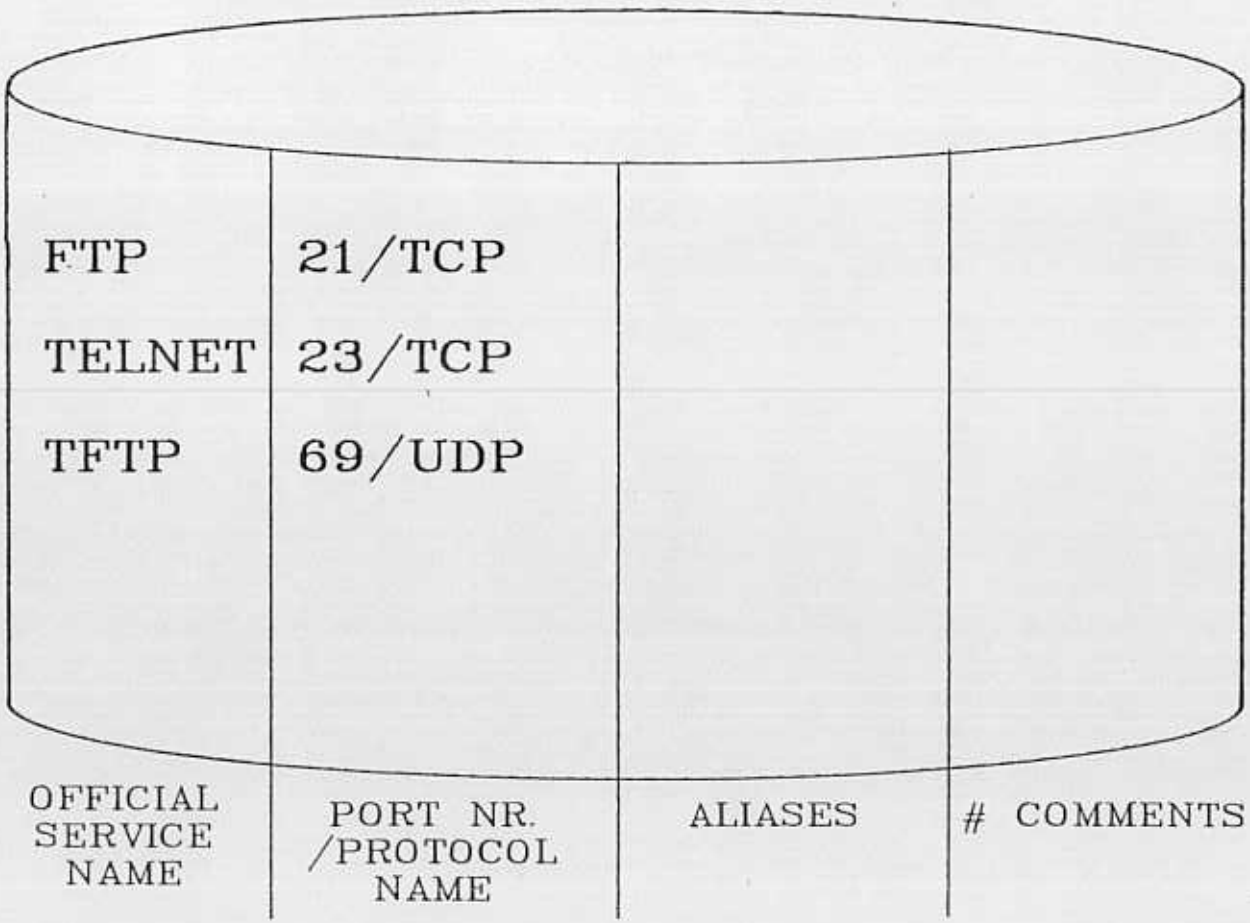
$SYSTEM.TCP_IP.HOSTS



Contains the mapping between the Internet Address and the names and aliases of the hosts on the network. This file exists on all hosts on the network. When a user references a host by name, the underlying application uses this file to translate the host name into an Internet Address.

TCP/IP SERVICES FILE

$SYSTEM.TCP_IP.SERVICES

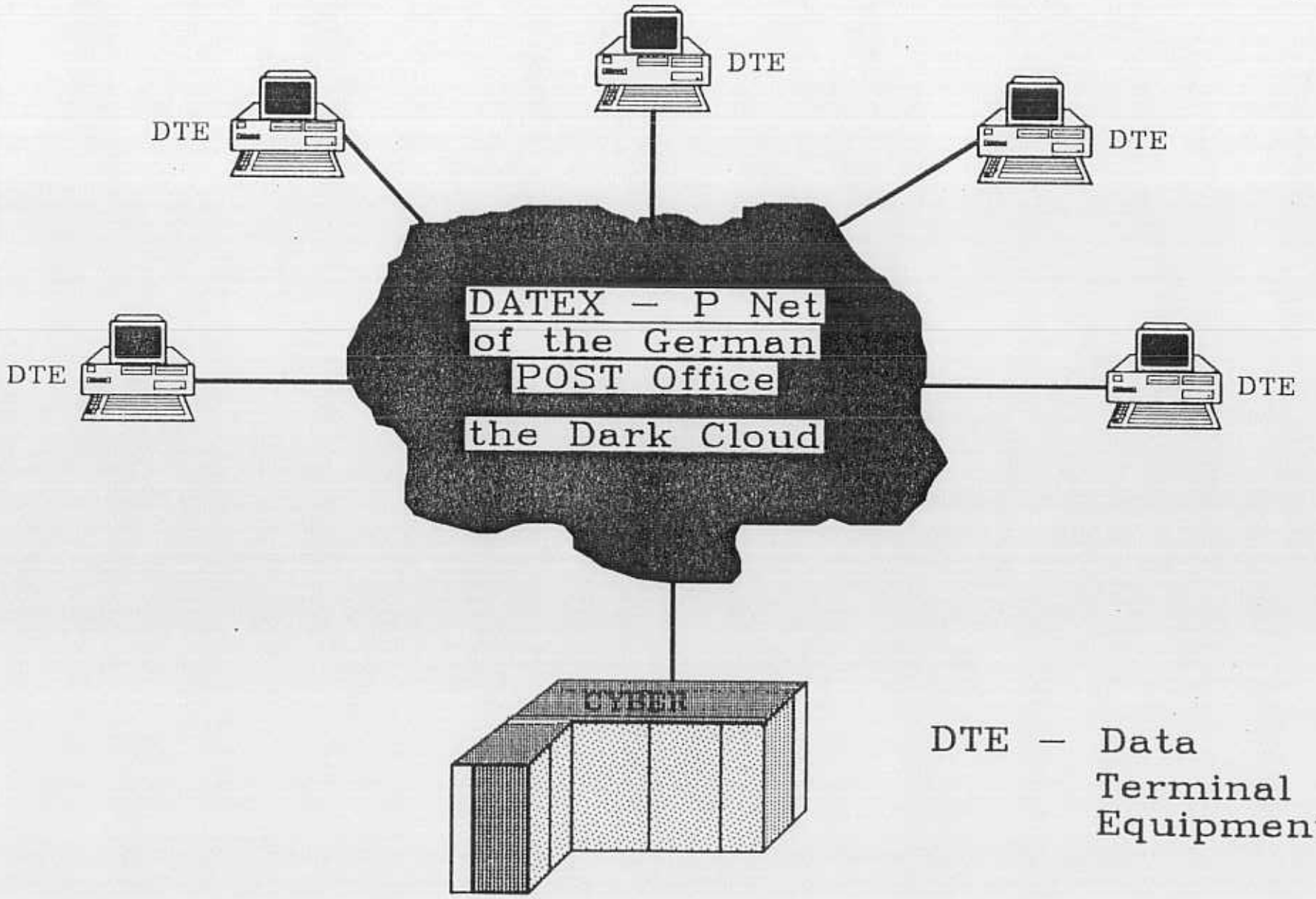


Contains information regarding the known SERVICES in the INETERNET.

X.25

DATEX-P

DATEX – P Net



DTE – Data Terminal Equipment

DATEX–P History

DATEX–P Phase I

April 1979 start of DATEX–P
August 1979 decision to use SL 10 processors from (Northern Telecom)
June 1980 Installation accepted by German Post Office
August 8. 1980 open to the users (trial)

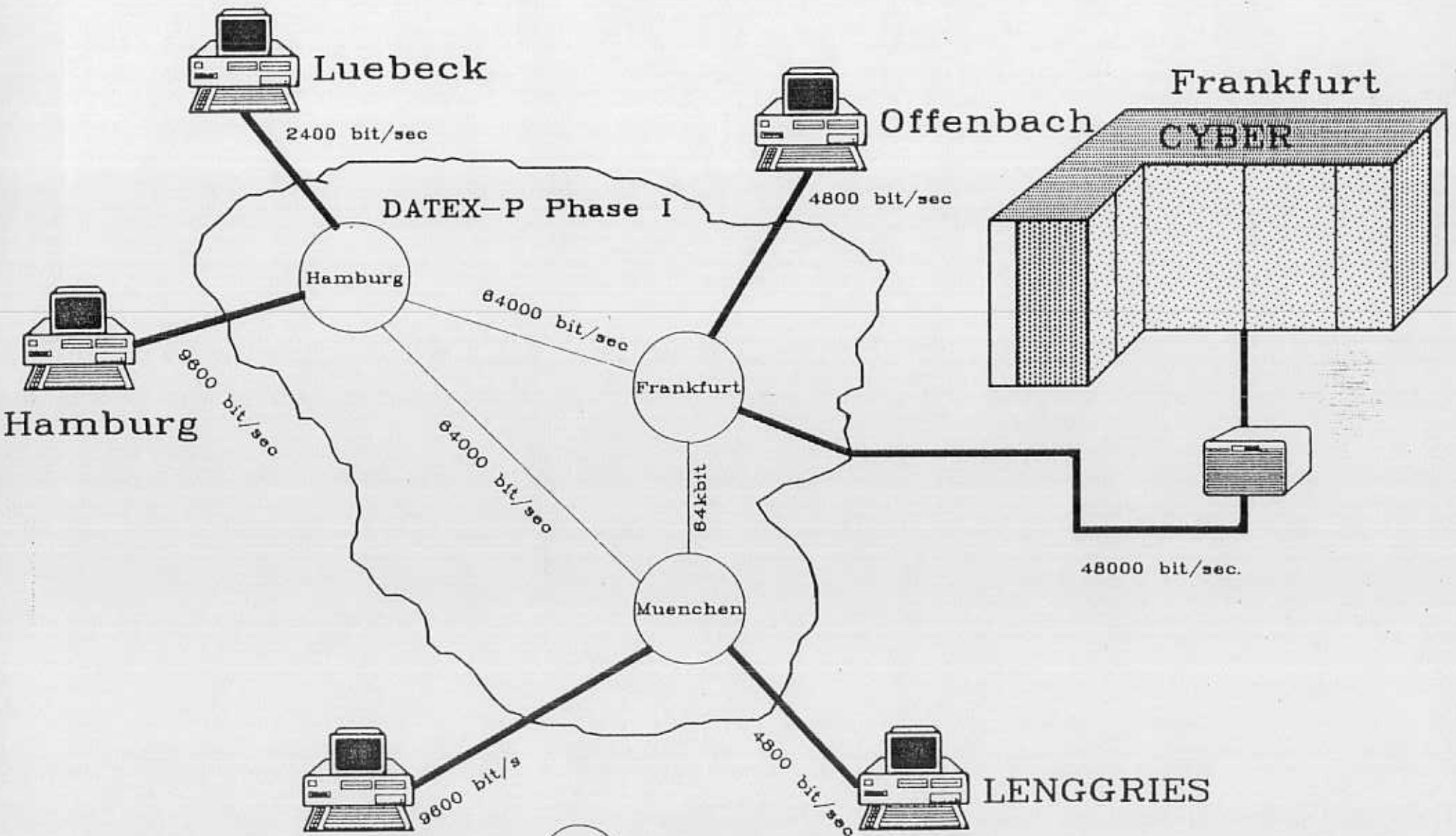
DATEX–P Net Status August 1985
17 Data Switching Computer Centers
88 National Lines (64000 bit) connecting Data Swithing Computer Centers
Connections to 45 Countries
14700 DTE Addresses
User growth 4% per month
60000 DTE Addresses predicted by 1990
SL 10 processors can support up to 30000 DTE Addresses

DATEX–P Phase II

New more powerfull processors from SIEMENS
10000 DTE connection instead of 600
30000 Packets/sec instead of 1000
600 calls/sec instead of 40
2.048 Mega bit/sec connetctions between Data Switching Computer Center
instead of 64000 bit/sec

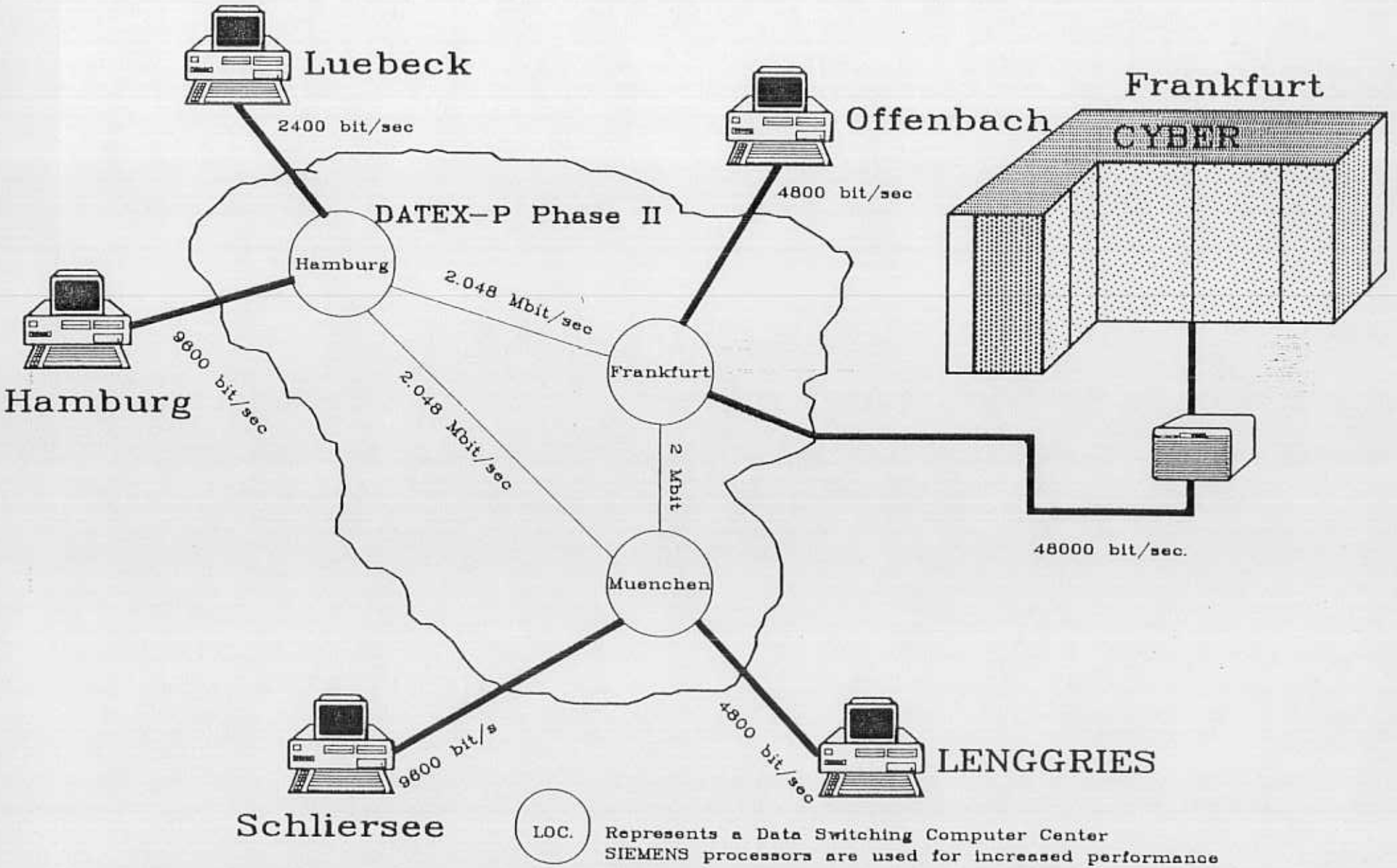
TIME TABLE FOR PHASE II
January 1985 Phase II biding opened
December 1985 decision for 2 test systems from SIEMENS
January 1989 Installation of SIEMENS processors

Datex-P Connections

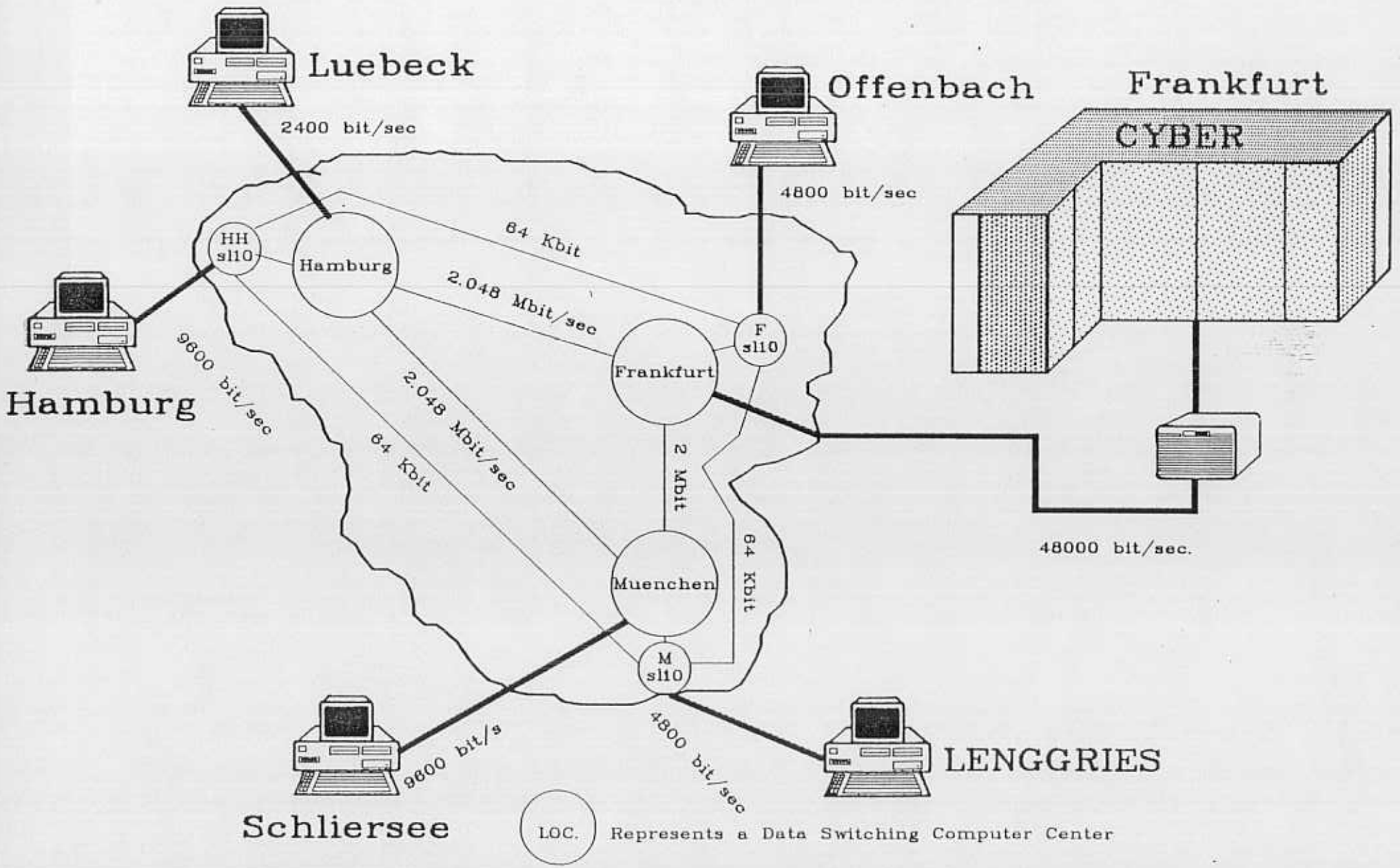


Represents a Data Switching Computer Center of the German Post Office useing SL 10 processores. This represents DATEX-P Phase I.

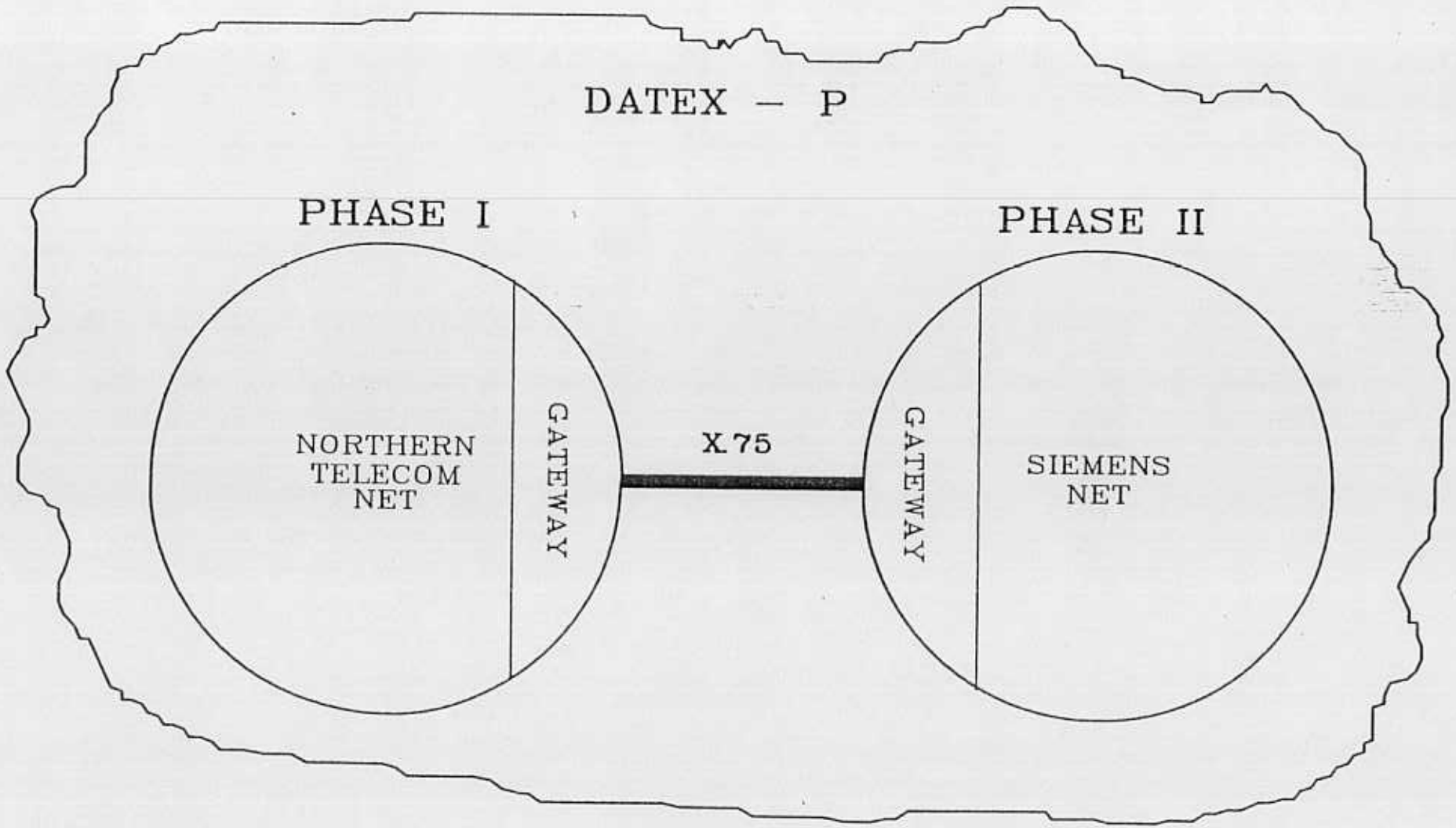
Datex-P Connections



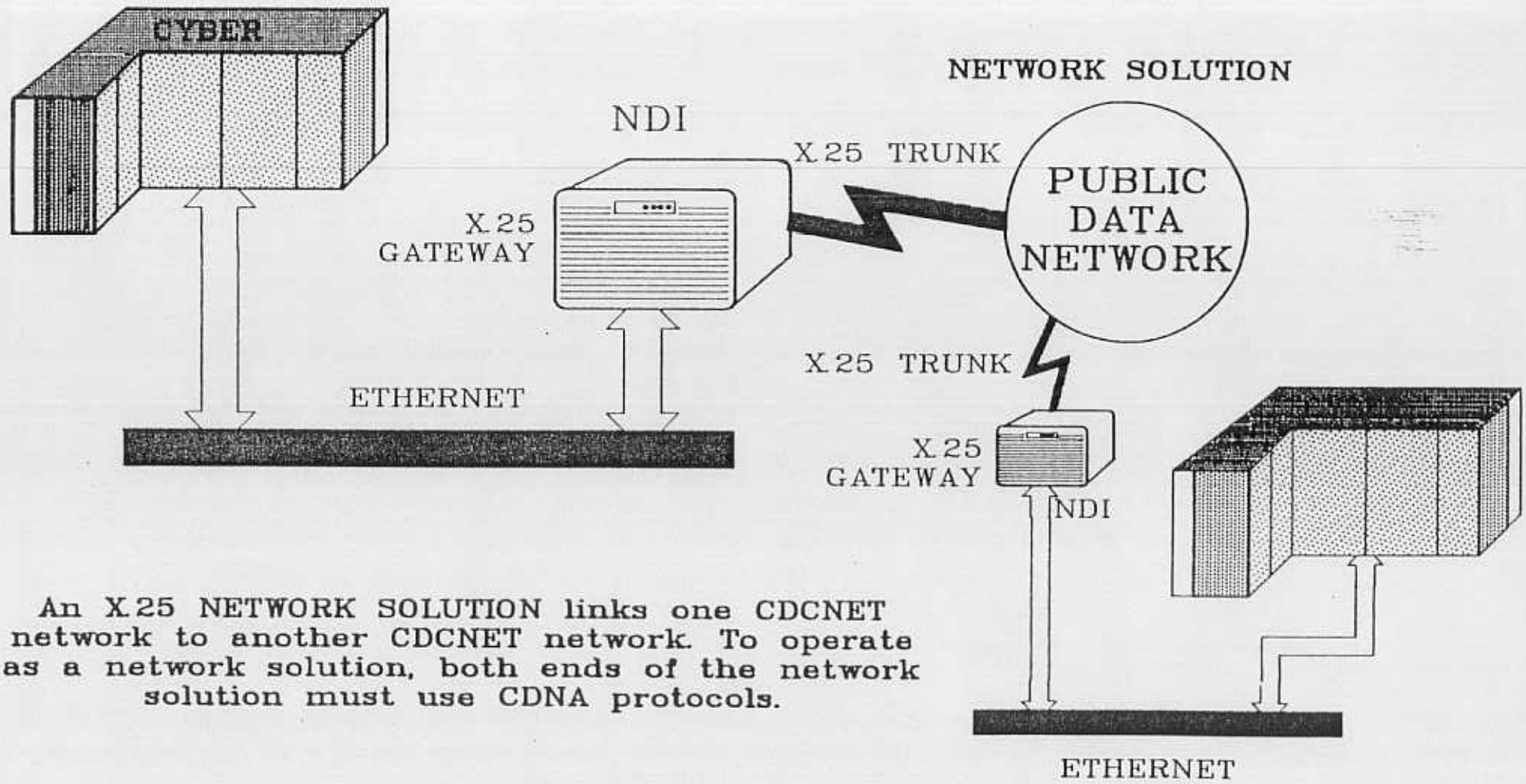
Datex-P Connections



Phase I to Phase II communication

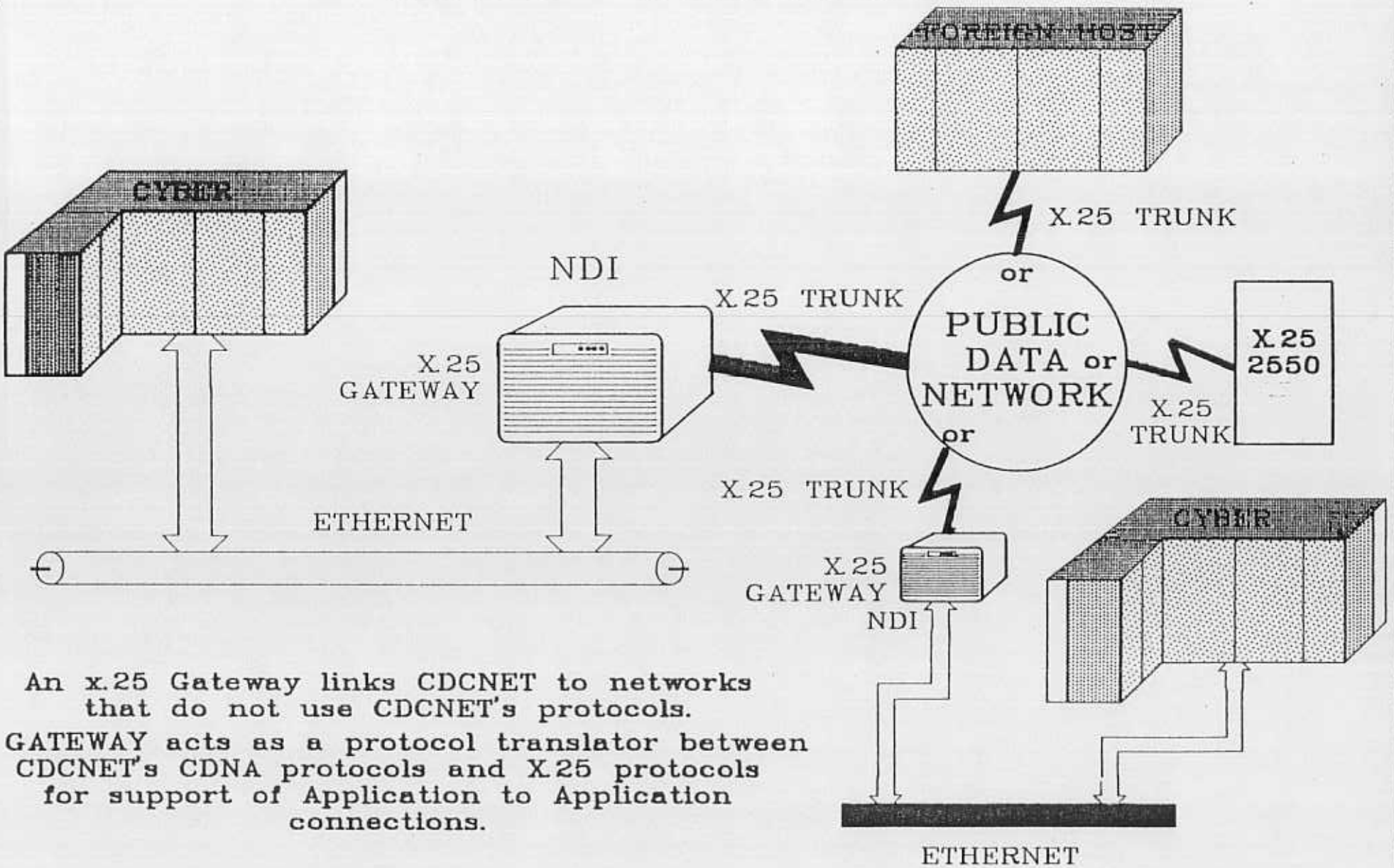


X.25 GATEWAY



An X.25 NETWORK SOLUTION links one CDCNET network to another CDCNET network. To operate as a network solution, both ends of the network solution must use CDNA protocols.

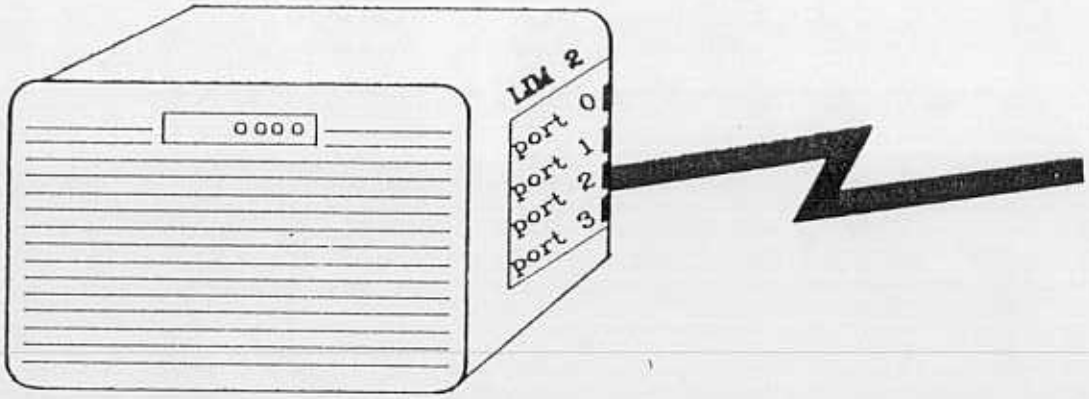
X.25 GATEWAY



An x.25 Gateway links CDCNET to networks that do not use CDCNET's protocols.

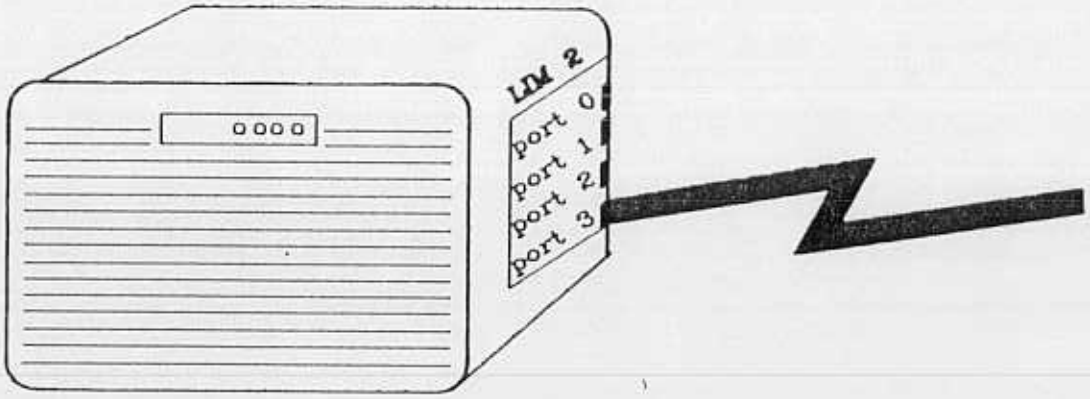
A GATEWAY acts as a protocol translator between CDCNET's CDNA protocols and X.25 protocols for support of Application to Application connections.

X.25 config. commands



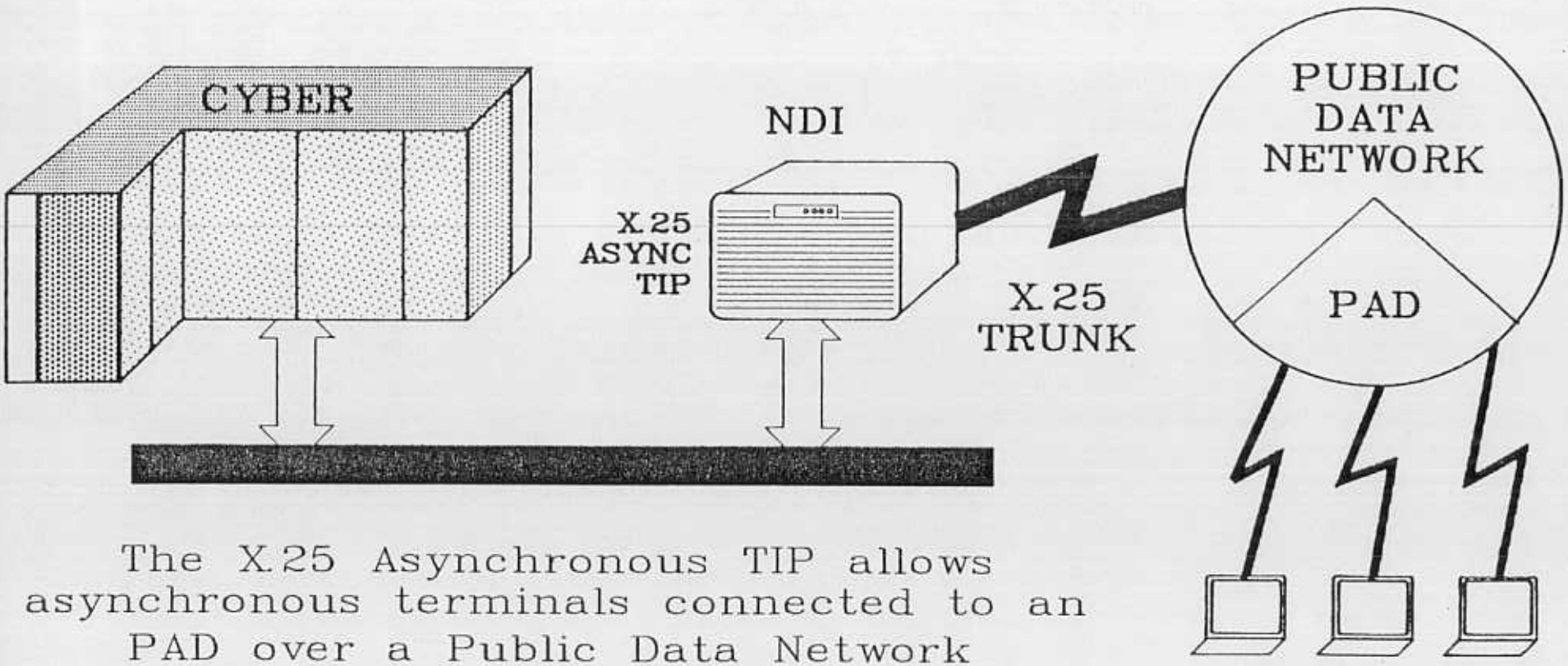

```
PROC SYSTEM_080025200190
DEFINE_SYSTEM SYSTEM_NAME=TDIX25
DEFINE_TIP TIP_NAME=ASYNCTIP
LOAD_MODULE M=ASYNCTIP_MODULE
LOAD_MODULE M=X25ASYNCTIP_MODULE

DEFINE_X25_TRUNK LIM=2 PORT=2 TRUNK_NAME=X25_A MODE=DCE ..
CLOCKING=EXTERNAL PF_RECOVERY_TIMER=4000 RETRANSMISSION_LISTING=10 ..
MAX_UNACK_FRAMES=7 TRUNK_SPEED=9600

DEFINE_X25_INTERFACE TN=X25_A PUBLIC_DATA_NETWORK=TELENET ..
TWOWAY_RANGE=1..16

DEFINE_X25_ASYNCTIP TRUNK_NAME=X25_A TDP=HFD_WDS

DEFINE_X25_GW GATEWAY_NAME=HFD_WDS_GW TRUNK_NAME=X25_A ..
VE_OUTCALL_TITLE=WDSPAD START=TRUE
```

X.25 config. commands




```
PROC SYSTEM_080025200190
DEFINE_SYSTEM SYSTEM_NAME=TDIX25
DEFINE_TIP TIP_NAME=ASYNCTIP
LOAD_MODULE M=ASYNCTIP_MODULE
LOAD_MODULE M=X25ASYNCTIP_MODULE

DEFINE_X25_TRUNK LIM=2 PORT=3 TRUNK_NAME=DATEX_P MODE=DTE ..
CLOCKING=EXTERNAL PF_RECOVERY_TIMER=4000 RETRANSMISSION_LIMIT=10 ..
TRUNK_SPEED=9600 MAX_UNPACK_FRAMES=7

DEFINE_X25_INTERFACE TN=DATEX_P PUBLIC_DATA_NETWORK=TELENET ..
TWOWAY_RANGE=1..10

DEFINE_X25_ASYNCTIP TN=DATEX_P TDP=DTXP_NO_USER_DATA..
PROCEDURE_FILE_OPTION=CALL_DATA_PROCEDURE ..
CONNECTION_DISCONNECT_TIMEOUT=4

DEFINE_X25_GW GN=DATEX_P_GW TN=DATEX_P VE_OUTCALL_TITLE=X25PAD ..
START=TRUE
```

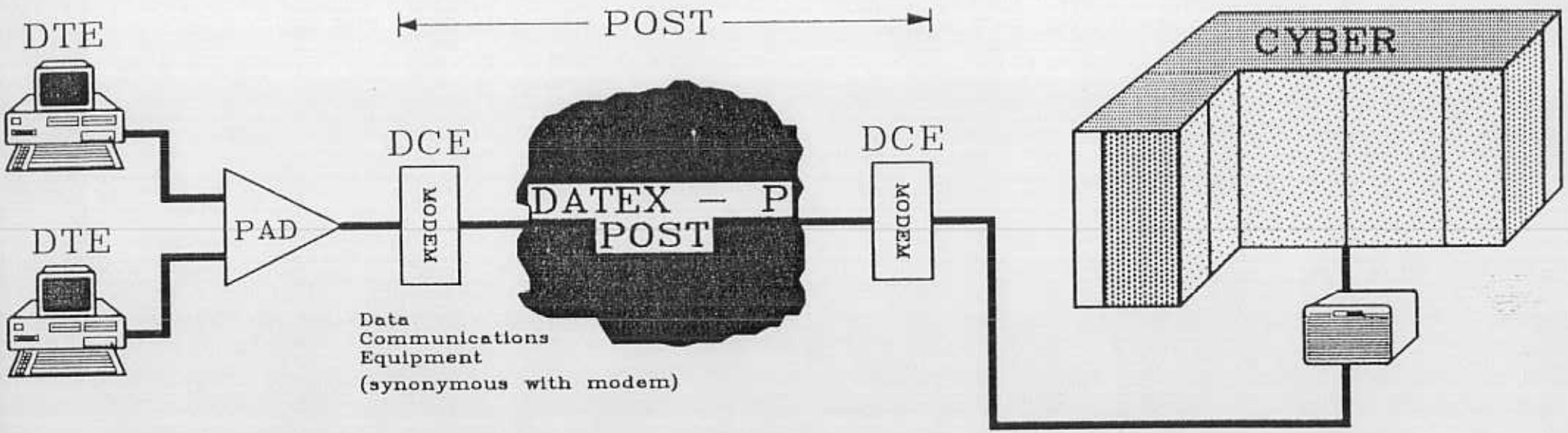
X.25 INTERFACE ASYNCHRONOUS TIP

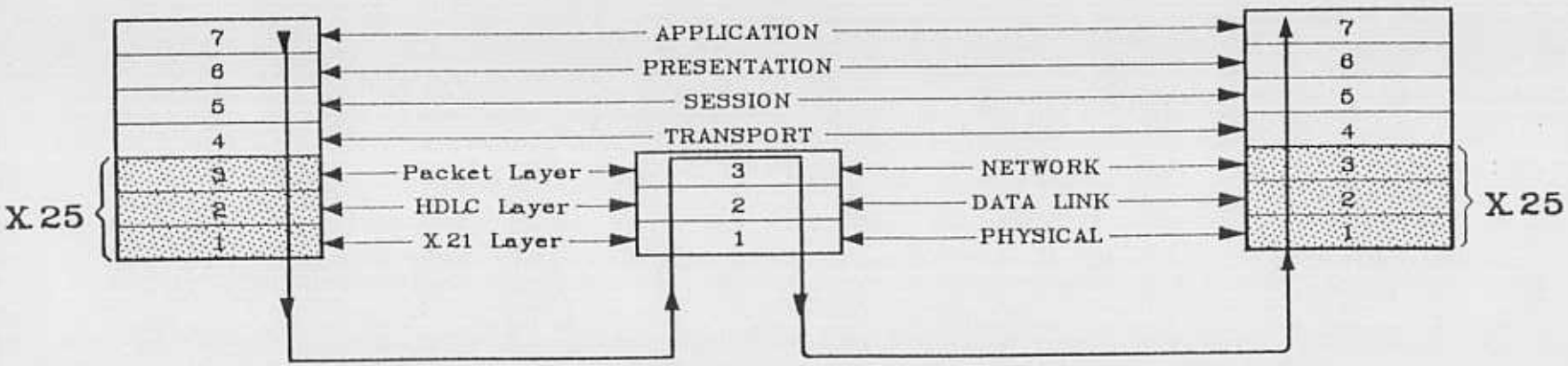


The X.25 Asynchronous TIP allows asynchronous terminals connected to an PAD over a Public Data Network to access CDCNET

A Terminal Interface Program (TIP) is software that resides in a DI and enables terminals that employ specific terminal protocols (async,HASP,3270) to communicate in CDCNET networks

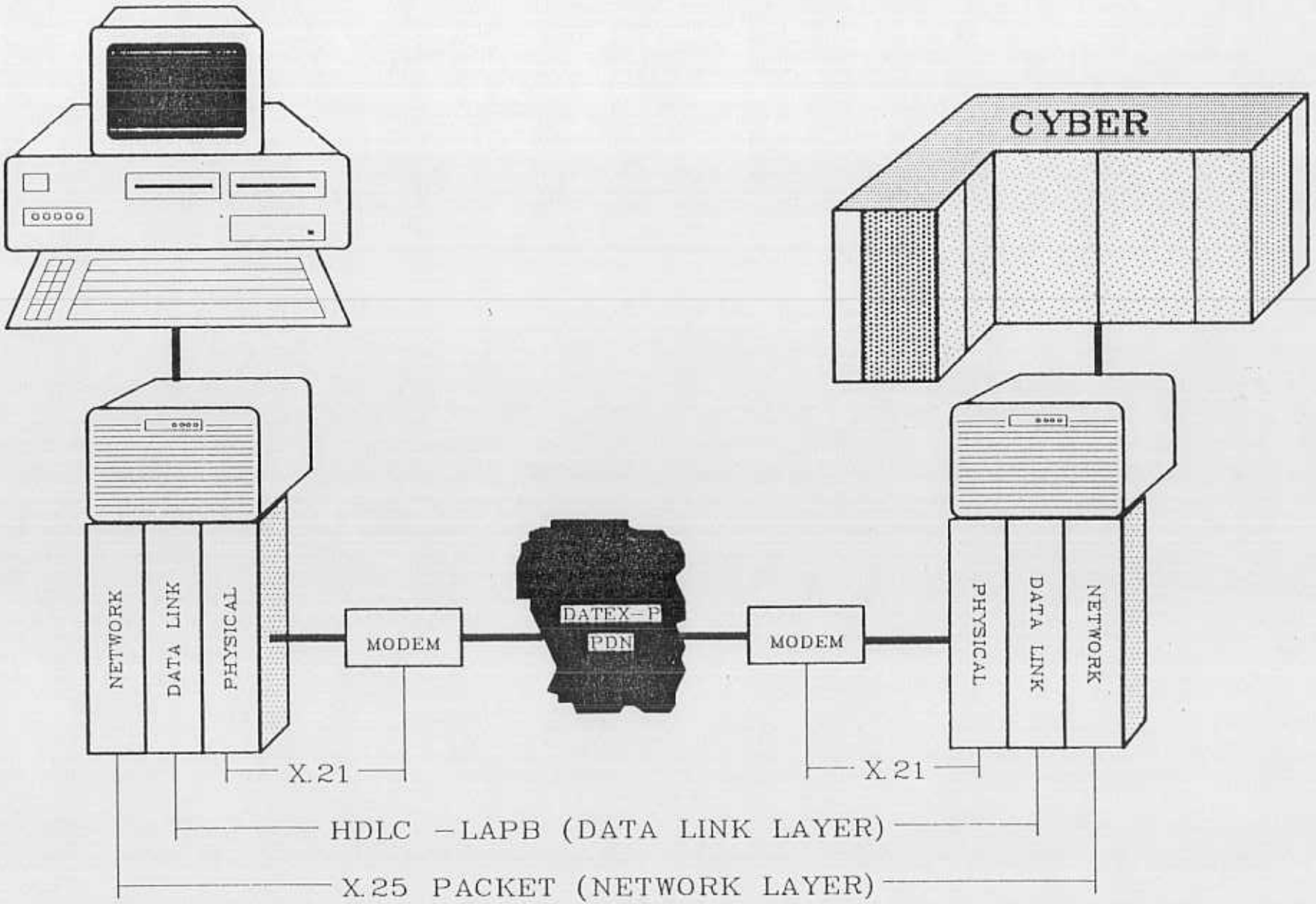
DATEX — P Net



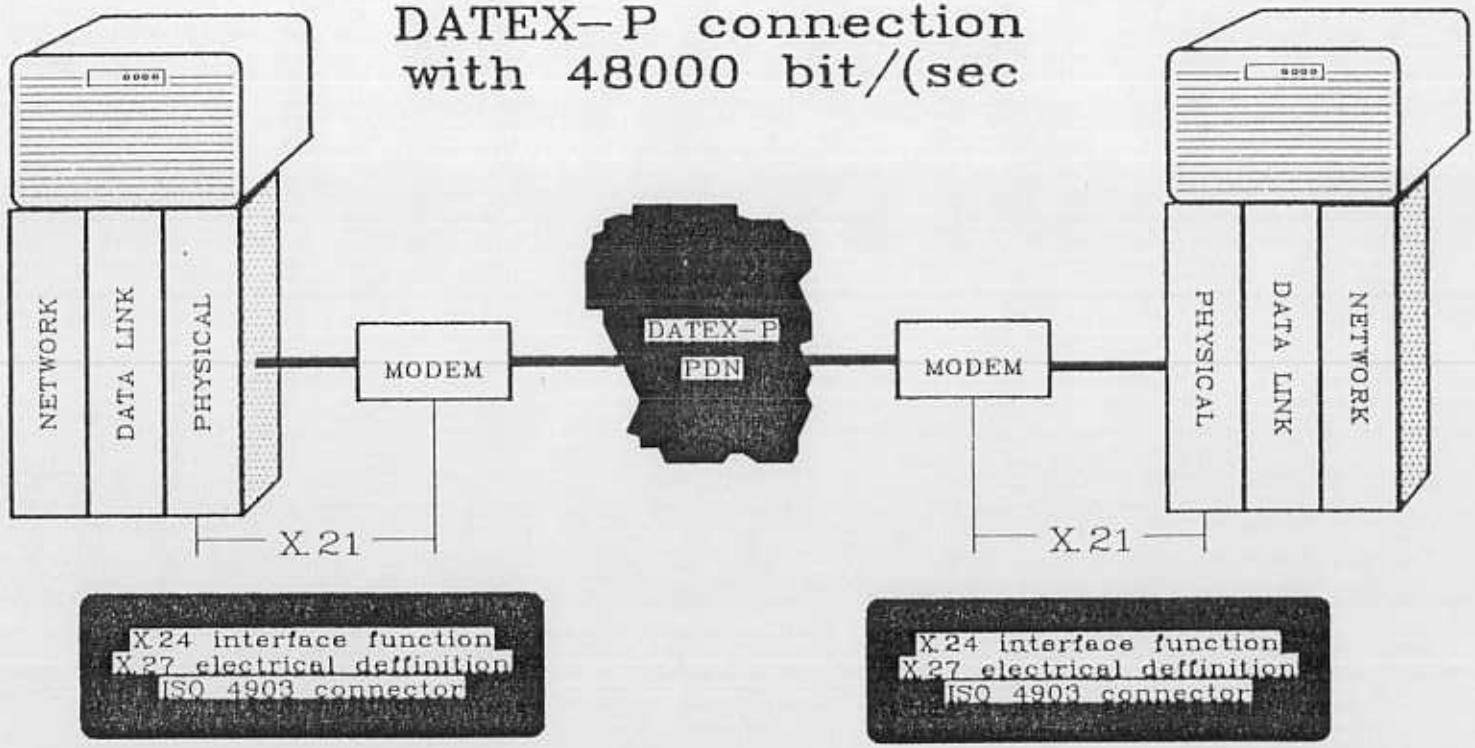


OSI MODEL

X.25 LAYERS


CYBER
NETWORK
DATA LINK
PHYSICAL
MODEM
DATEX-P
PDN
MODEM
PHYSICAL
DATA LINK
NETWORK
X.21
X.21
HDLC – LAPB (DATA LINK LAYER)
X.25 PACKET (NETWORK LAYER)

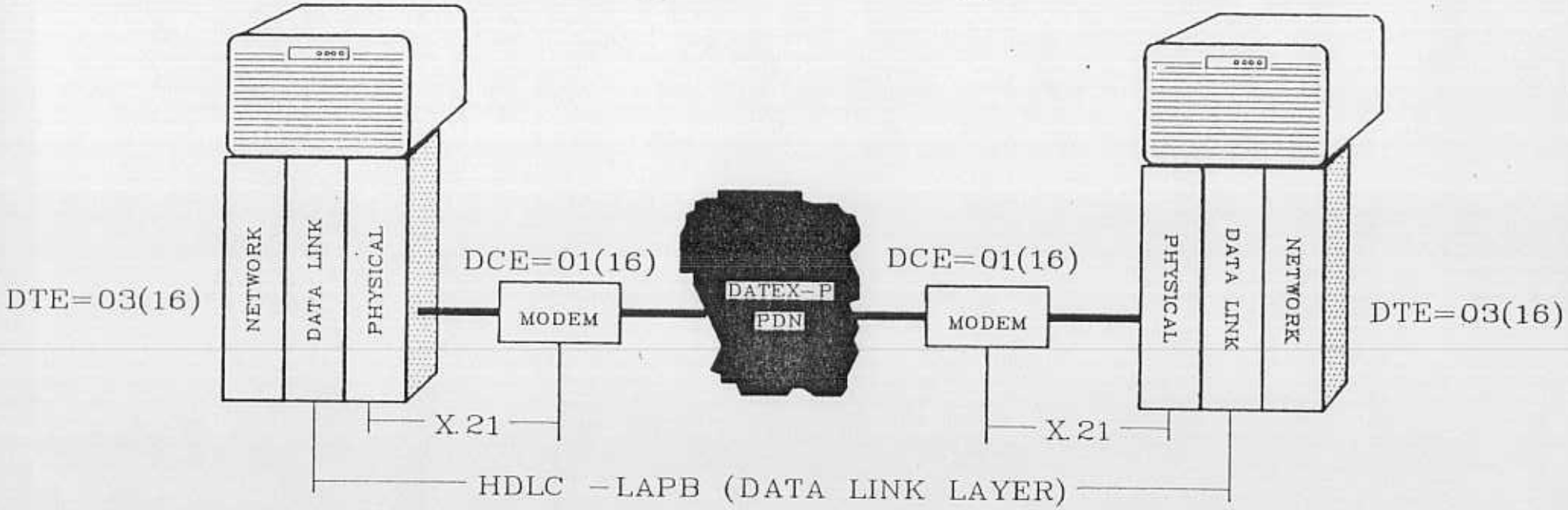
Layer 1 (Pysical) protocol



The Physical Layer

- is the lowest layer -
- is the physical transmission medium -
- contains mechanical and electrical deffinitions -

X.25 Layer 2 protocol



HDLC Format

FLAG = 7E(16)

FLAG	ADR.	CONT	DATA	FCS	FLAG
8 bit	8 bit	8 bit	variable	16 bit	8 bit

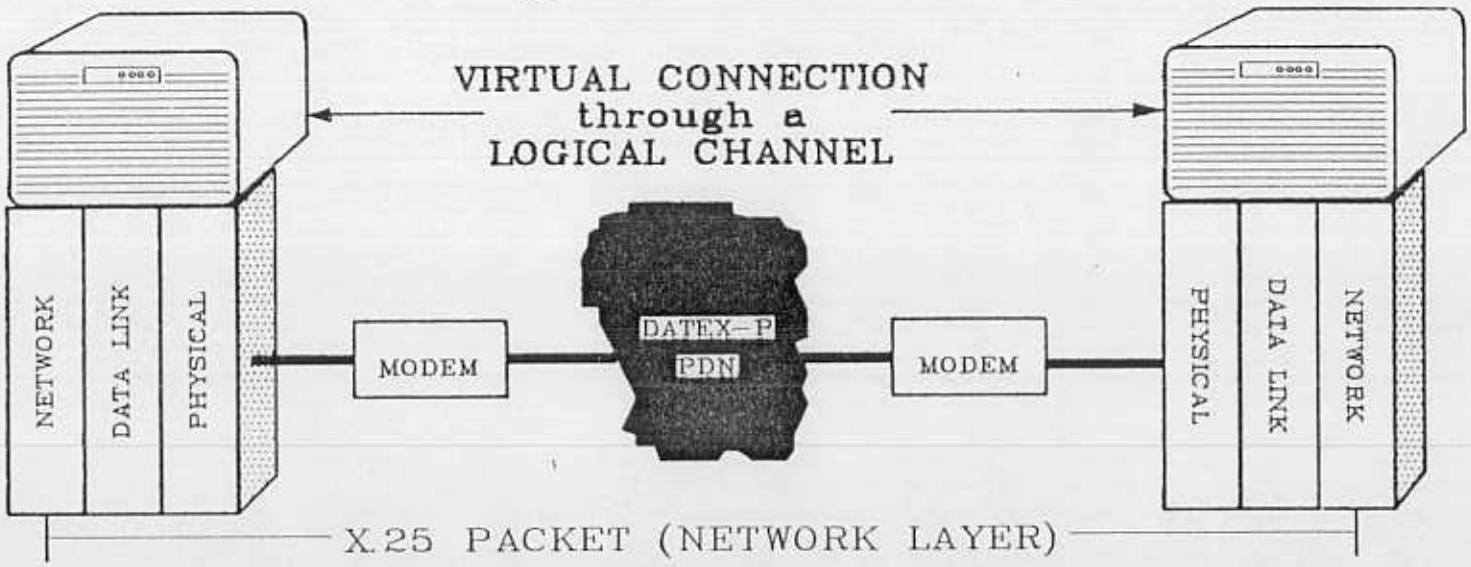
This Layer contains the following
- recognizes data transfere errors of the lower layer and corrects them -
- this error recognition is done via the FCS (Frame Check Sequence) -
- adds a destination address (01=DCE,03=DTE) -
- control field is used to control the data transfere -

FOR EXAMPLE

FCS

0D36FD7E012C100502444153205741522053504964 5A4520210DD847 7E0121F1B07E03...

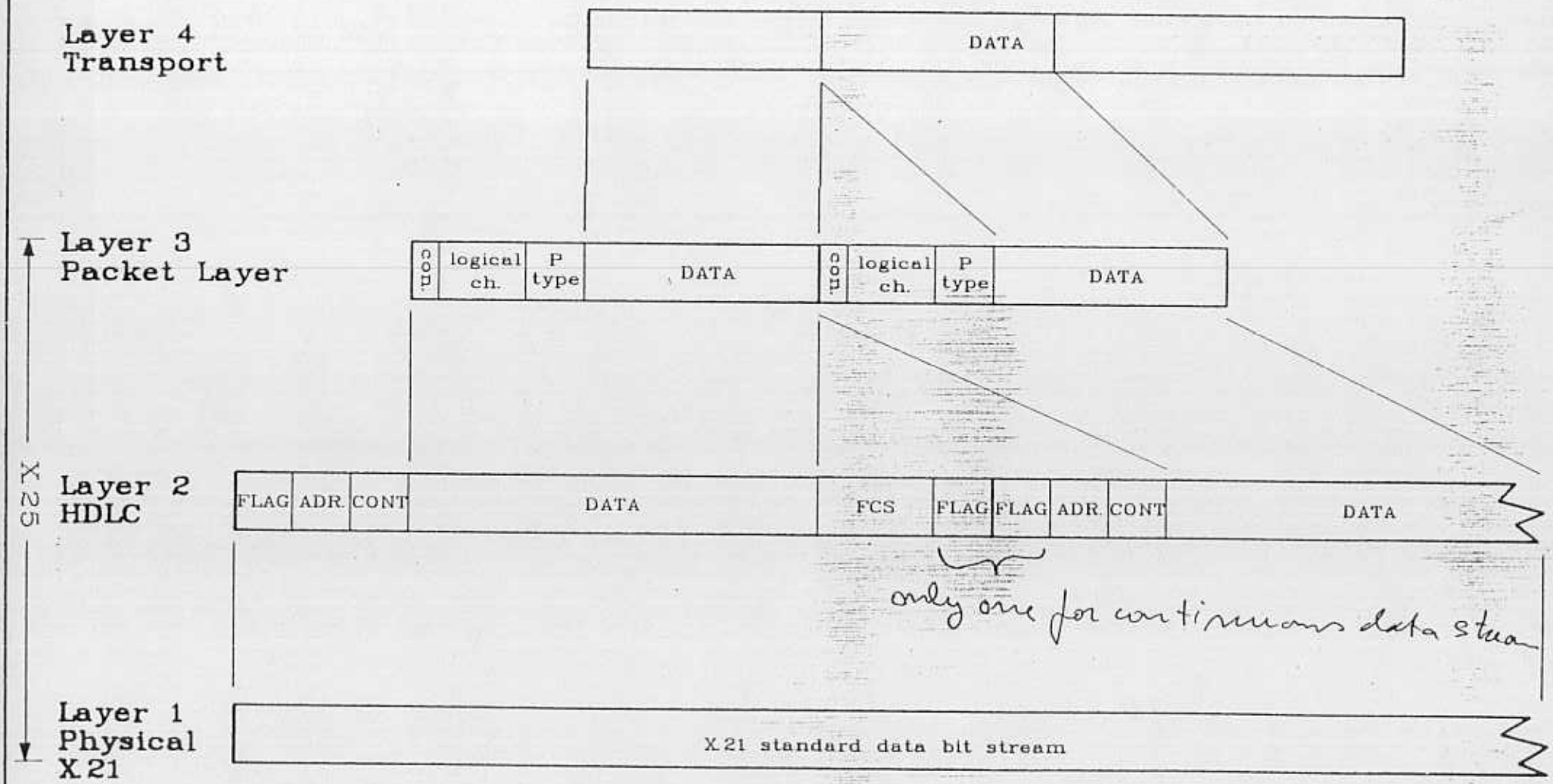
X.25 Layer 3 Protocol



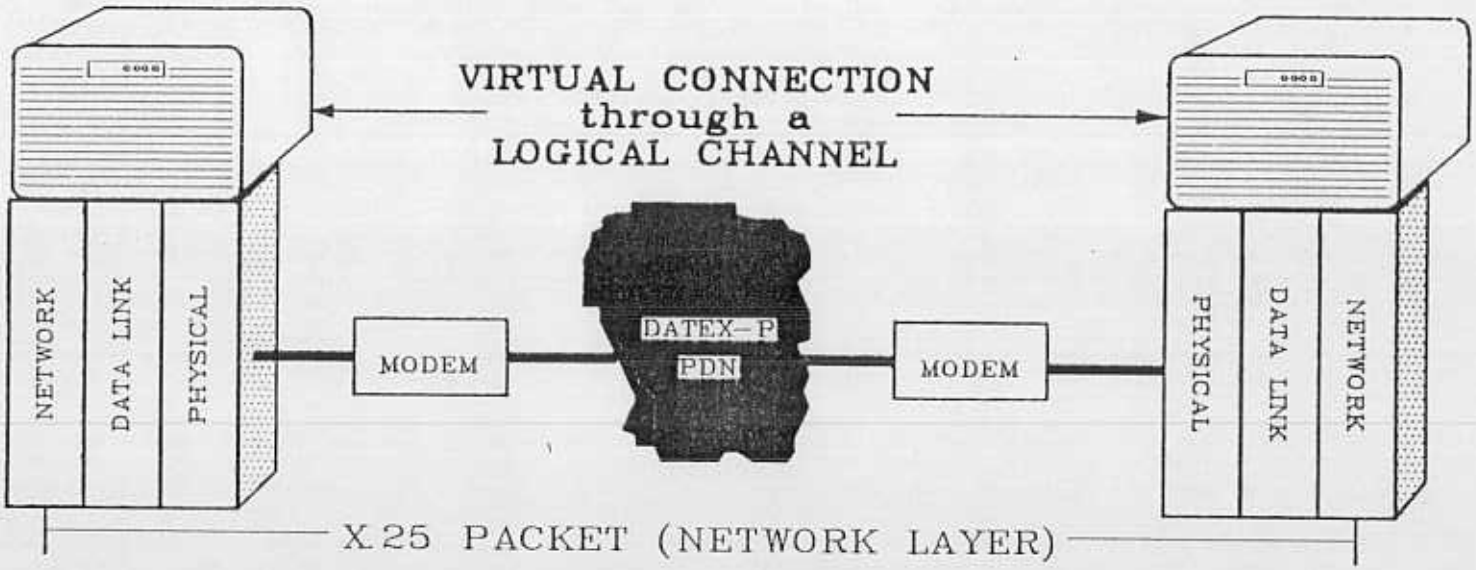
Network Layer contains the following

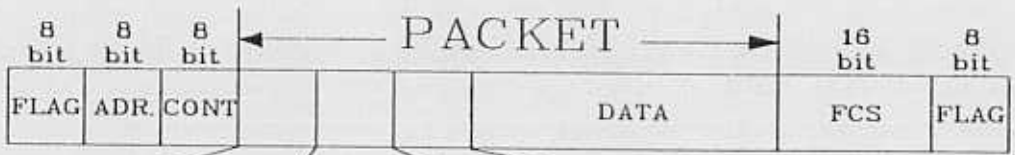
- transparent data transfere over the whole connection -
- addressing of the receiver -
- multiplexing of several logical channels -
- flow control for each logical channel -
- connection build up between end points -
- reseting of connections -

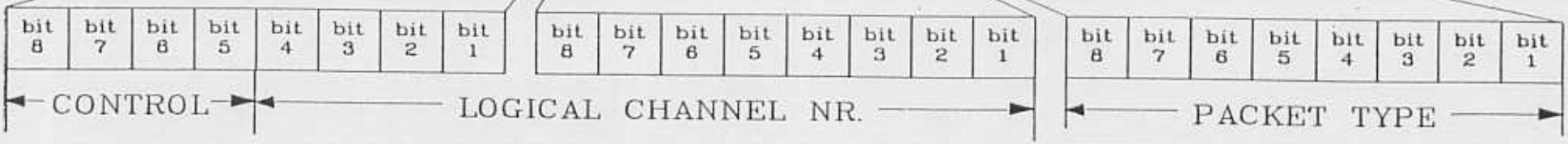
X.25 DATA PACKET TRANSFERE



X.25 Layer 3 Protocol







DATA PACKET	PACKET REC.CNT.			more data	PACKET SENT CNT.			0
RESET PACKET	0	0	0	1	1	0	1	1

FOR EXAMPLE

0D36FD7E012C1005024441532057415220535049645A4520210DD8477E0121F1B07E03...

NPA REPORTS - CONFRP1

THINGS TO LOOK FOR:

1. SYSTEM (LOGICAL) NAME AND SYSTEM ADDRESS (SYSTEM ID) CORRELATION
2. PER CENT CPU UTILIZATION SHOULD BE RELATIVELY LOW
3. MEMORY AND BUFFER STATES SHOULD BE GOOD (OTHER STATES ARE: FAIR, POOR, CONGESTED)
4. DATE/TIME OF LAST RELOAD CAN CORRELATE WITH DI DUMPS TO FIND OUT WHY THE DI RELOADED

SAMPLE REPORT:

```
REPORT DAY: 88/02/09                                                PAGE    1
                                CONFRP1 REPORT
          TITLE = AHO_NDI_100060                    SID = 080025100060

   DATE       TIME         SYSTEM ID     LOG ID
 ******** ********** ************  ******

88/02/09 05.55.00204 080025100060      593
DI SYSTEM STATUS
SYSTEM NAME = AHO_NDI_100060
SYSTEM ADDRESS = 080025100060(16)
BOOT VERSION NUMBER = 4308(16)
SOFTWARE RELEASE LEVEL = 4308(16)
NUMBER OF TASKS = 23
FREE SMM MEMORY = 248988
PERCENT CPU UTILIZATION = 13
BUFFER STATE = GOOD
MEMORY STATE = GOOD
DATE AND TIME OF LAST RELOAD = 88/02/05  21.22.59

BUFFER STATUS
TYPE         TOTAL BUFFERS  AVAILABLE BUFFERS  BUFFER SIZE
DATA         1720           1074               144
DESCRIPTOR   566            545                32

SMM MEMORY STATUS
TOTAL MEMORY  AVAILABLE MEMORY  EXTENTS    DELOADABLE MEMORY
1048576       248988            132        58148

PMM MEMORY STATUS
TOTAL MEMORY  AVAILABLE MEMORY  EXTENTS    DELOADABLE MEMORY
131072        24292             5          0

MPB RAM STATUS
TOTAL MEMORY  AVAILABLE MEMORY  EXTENTS    DELOADABLE MEMORY
16384         2060              2          0
LARGEST SMM MEMORY EXTENT AVAILABLE = 200690
```

NPA REPORTS - ETHRRP1

THINGS TO LOOK FOR:

1. CHECK THE COLLISIONS COLUMN

SAMPLE REPORT:

814PORT DAY: 86/09/05 PAGE 1

ETHRRP1 REPORT

TITLE = TDI_78 SID = 080025100078

TIME	CS	XMIT 255 RECV	XMIT 511 RECV	XMIT 767 RECV	XMIT 1023 RECV	XMIT 1279 RECV	XMIT 1535 RECV	COLLISIONS
0912	6	2262	52	2	0	2	7	0
		2651	179	105	0	13	0	
1012	6	2196	41	2	0	2	4	2
		2370	458	63	2	6	0	
1212	6	2629	41	2	0	2	5	5
		2730	472	127	5	20	0	
1312	6	4509	61	2	0	2	5	2
		3423	1615	79	1	4	0	
1412	6	1971	48	3	0	1	4	4
		2506	119	62	8	27	0	
1512	6	4179	34	2	0	4	8	0
		4374	311	173	9	22	0	

NPA REPORTS - ETHRRP2

THINGS TO LOOK FOR:

1. CRC ERRORS = PROBLEMS WITH ESCI, TRANSCEIVER, EHTERNET COAX
2. ALIGN. ERRORS = FRAME NOT VALID NUMBER OF OCTETS
3. OVERRUN ERRORS = TOO MANY BUFFER FRAGMENTS IN THE DI's MEMORY
4. RESOURCE ERRORS = NOT ENOUGH MEMORY IN THE DI
5. ABNORMAL LOGIC = SUM OF COLLISIONS + LOST CARRIER SENSE + TRANSMISSION UNDERRUNS (A CODING ERROR) + HARDWARE ERRORS

SAMPLE REPORT:

REPORT DAY: 86/09/05 PAGE 1

ETHRRP2 REPORT

TITLE = MTI_83 SID = 080025100083

ENDING TIME	CS	FRAMES RECEIVED	FRAMES SENT	CRC ERRORS [20] [0]	ALIGN. ERRORS [30] [0]	OVERRUN ERRORS [40] [0]	RESOURCE ERRORS [100] [0]	ABNORMAL LOGIC [3] [0]
0924	6	13144	13581	0	0	20	0	0
1024	6	13291	13704	0	27	0	103>	0
1224	6	11549	11782	0	0	0	0	0
1424	6	8276	8175	0	0	44>	0	0
1524	6	13735	14154	0	33>	0	0	0

NPA REPORTS - EVNTRP3

THINGS TO LOOK FOR:

1. FREQUENCY OF ERRORS OF EACH SEVERITY LEVEL. PAY SPECIAL ATTENTION TO "ERROR", "FATAL", AND "CATASTROPHE" COLUMNS

SAMPLE REPORT:

REPORT DAY: 86/01/01 PAGE 1

EVNTRP3 REPORT

LOG NUMBER	FREQUENCY	INFORMATIVE	WARNING	ERROR	FATAL	CATASTROPHIC
19	9	9	0	0	0	0
67	2	2	0	0	0	0
129	1	0	0	1	0	0
207	4	0	4	0	0	0
210	1	1	0	0	0	0
429	4	4	0	0	0	0
457	4	0	4	0	0	0
502	3	3	0	0	0	0
546	4	4	0	0	0	0
548	1	1	0	0	0	0
552	9	9	0	0	0	0
559	1	1	0	0	0	0
560	1	1	0	0	0	0
561	1	1	0	0	0	0
575	2	2	0	0	0	0
593	4	4	0	0	0	0
594	4	4	0	0	0	0
595	4	4	0	0	0	0
596	4	4	0	0	0	0
597	4	4	0	0	0	0
603	1	0	0	0	1	0
605	50	50	0	0	0	0
631	1	0	0	1	0	0
TOTALS	119	108	8	2	1	0

WSE: Explain - CDCNET_LOG-MESSAGE

EXPC2M MN=603

EDIC1M to edit message

NPA REPORTS - HDLCRP3

THINGS TO LOOK FOR:

1. CRC ERRORS COLUMN INDICATES EITHER LINES NOISY OR TOO MANY HDLCs ASSIGNED TO ONE CIM BOARD

SAMPLE REPORT:

REPORT DAY: 86/09/05 PAGE 1

HDLCRP3 REPORT

TITLE = SVLN01 SID = 0800253001A7

ENDING TIME	LI	PO	S FRAMES RECVD	S FRAMES XMIT	U FRAMES RECVD	U FRAMES XMIT	CRC ERRORS	BAD FRAMES	FRAMES OUT OF SEQUENCE
0050	1	0	4208	3845	1	1	313	7	4
0050	1	1	4128	3198	0	0	106	0	2
0050	1	2	0	0	0	0	0	0	0
0723	1	0	2587	2350	1	1	0	0	0
0723	1	1	2705	2300	1	1	0	0	0
0723	1	2	0	0	0	0	0	0	0
0823	1	0	2864	2205	1	2	19	0	2
0823	1	1	3052	2319	0	0	16	0	1
0823	1	2	0	0	0	0	0	0	0
0923	1	0	3417	1370	5	9	306	2	9
0923	1	1	3318	2655	333	332	292	21	7
0923	1	2	0	0	0	0	0	0	0
1223	1	0	1357	2955	3	1	13	0	6
1223	1	1	3952	3197	0	0	27	0	1
1223	1	2	0	0	0	0	0	0	0
1423	1	0	895	3357	0	0	0	0	0
1423	1	1	3341	2961	0	0	0	0	0
1423	1	2	0	0	0	0	0	0	0
1623	1	0	503	8231	4	2	2	0	8
1623	1	1	3239	2510	0	0	0	0	0
1623	1	2	0	0	0	0	0	0	0
1723	1	0	1852	7764	0	0	1	0	0
1723	1	1	2980	2515	0	0	0	0	0
1723	1	2	0	0	0	0	0	0	0
1823	1	0	2347	3568	0	0	0	0	0
1823	1	1	2656	2488	0	0	0	0	0
1823	1	2	0	0	0	0	0	0	0
1923	1	0	2487	6013	0	0	0	0	0
1923	1	1	2776	2794	0	0	0	0	0
1923	1	2	0	0	0	0	0	0	0
2023	1	0	3027	2829	0	0	0	0	0
2023	1	1	2637	2388	0	0	0	0	0
2023	1	2	0	0	0	0	0	0	0
2123	1	0	1930	4927	0	0	0	0	0
2123	1	1	2797	2297	0	0	0	0	0
2123	1	2	0	0	0	0	0	0	0

NPA REPORTS - HRDWRP1

THINGS TO LOOK FOR:

1. HARDWARE RELATED ALARMS LISTED BY DATE AND TIME

SAMPLE REPORT:

```
REPORT DAY: 86/01/01                                              PAGE

                                HRDWRP1 REPORT
                            START TIME = 0000 HOURS

   DATE      TIME      SYSTEM ID     LOG ID SEVERITY
 -------- ---------- ------------  ------ ------------

 86/01/01 00.00.00927 0800253000A2     338   ERROR
 --ERROR--  MPB FAILED ON-BOARD TESTING
 BEFORE INITIALIZATION WAS SUCCESSFUL.
 SLOT NUMBER= 0
 FATAL ERRORS= 7

 86/01/01 00.00.00930 0800253000A2     340   ERROR
 --ERROR--  PMM HAD RECOVERED PARITY ERRORS
 DURING ON-BOARD TESTING.
 SLOT NUMBER= 1
 ERRORS= 39168
 FIRST FAILING ADDRESS= 00010000

 86/01/01 00.00.00933 0800253000A2     341   ERROR
 --ERROR--  SMM SINGLE BIT ERRORS OCCURRED
 DURING INITIALIZATION.
 SLOT NUMBER= 2
 ERRORS= 1942
 ERROR LOG= 0648

 86/01/01 00.00.00935 0800253000A2     342   ERROR
 --ERROR--  SMM MULTIPLE BIT ERRORS OCCURRED
 DURING INITIALIZATION.
 SLOT NUMBER= 2
 ERRORS= 11671
 ERROR LOG= 0473

 86/01/01 00.00.55028 0800253000A2      19   INFORMATIVE
 CONFIGURATION COMPLETE.
 CONFIGURATION FILE SOURCE:
 NETWORK ID: 41454646, SYSTEM ID: 08002530008E
```

NPA REPORTS - HRDWRP2

THINGS TO LOOK FOR:

1. HARDWARE RELATED ALARMS LISTED BY SEVERITY AND DI

SAMPLE REPORT:

```
REPORT DAY: 86/01/01                                              PAGE    1

                                HRDWRP2 REPORT
                                    ERROR

 DATE        TIME        SYSTEM ID     LOG ID SEVERITY
 --------  ------------------------  ------ -------------

86/01/01 00.00.00927 08002530000A2      338 /  ERROR /
--ERROR--  MPB FAILED ON-BOARD TESTING
BEFORE INITIALIZATION WAS SUCCESSFUL.
SLOT NUMBER= 0
FATAL ERRORS= 7

86/01/01 00.00.00930 08002530000A2      340 /  ERROR /
--ERROR--  PMM HAD RECOVERED PARITY ERRORS
DURING ON-BOARD TESTING.
SLOT NUMBER= 1
ERRORS= 39168
FIRST FAILING ADDRESS= 00010000
```

NPA REPORTS - HRDWRP3

THINGS TO LOOK FOR:

1. FREQUENCY OF ERRORS OF EACH SEVERITY LEVEL. PAY SPECIAL ATTENTION TO "ERROR", "FATAL", AND "CATASTROPHE" COLUMNS

SAMPLE REPORT:

REPORT DAY: 86/01/01 PAGE 1

HRDWRP3 REPORT

LOG NUMBER	FREQUENCY	INFORMATIVE	WARNING	ERROR	FATAL	CATASTROPHIC
19	9	9	0	0	0	0
351	1	1	0	0	0	0
457	4	0	4	0	0	0
578	4	0	0	4	0	0
631	1	0	0	1	0	0
TOTALS	19	10	4	5	0	0

NPA REPORTS - MCISRP3

THINGS TO LOOK FOR:

1. CHECK "% BAD" COLUMNS FOR QUICK INDICATION OF PP CHANNEL'S OPERATION

SAMPLE REPORT:

REPORT DAY: 86/09/05 PAGE 1

MCISRP3 REPORT

TITLE = MOI_8A SID = 08002510008A

ENDING TIME	CS	BLOCKS IN	BLOCKS BAD IN	% BAD [100] [0]	BLOCKS OUT	BLOCKS BAD OUT	% BAD [100] [0]
	card slot						
0124	7	0	0	0	0	0	0
0224	7	36	0	0	36	0	0
0324	7	72	0	0	72	0	0
0424	7	0	0	0	0	0	0
0524	7	0	0	0	0	0	0
0624	7	764	0	0	767	0	0
0724	7	280	0	0	283	0	0
0824	7	912	0	0	909	0	0
0924	7	478	0	0	492	0	0
1024	7	4419	0	0	4431	0	0
1224	7	535	0	0	543	0	0
1424	7	1032	0	0	1040	0	0
1524	7	3328	0	0	3332	0	0
1624	7	2328	0	0	2330	0	0
1724	7	5029	0	0	5041	0	0
1824	7	81	0	0	82	0	0
1924	7	6	0	0	6	0	0
2024	7	0	0	0	0	0	0
2124	7	0	0	0	0	0	0
2224	7	0	0	0	0	0	0
2324	7	22770	0	0	22801	0	0