FIG.1

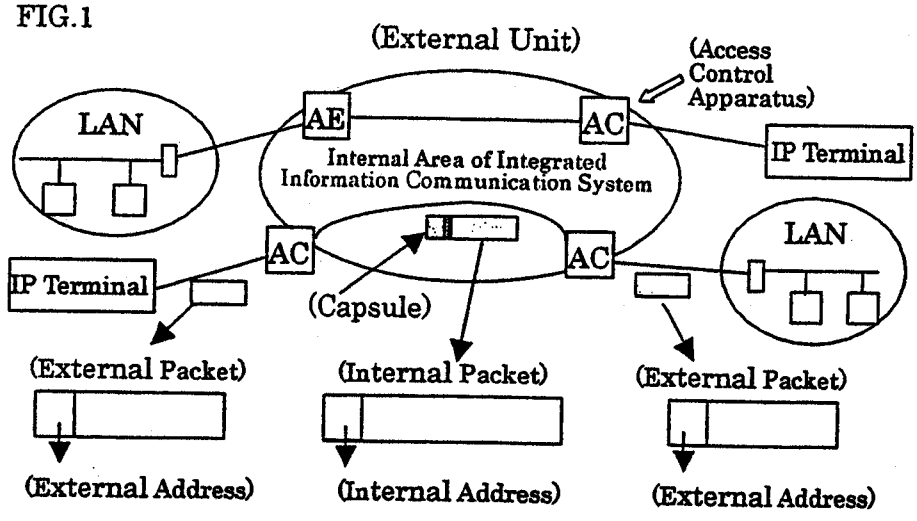

(External Unit)
(Access Control Apparatus)
LAN
AE
AC
Internal Area of Integrated Information Communication System
IP Terminal
AC
AC
LAN
IP Terminal
(Capsule)
(External Packet)
(Internal Packet)
(External Packet)
(External Address)
(Internal Address)
(External Address)

FIG.2

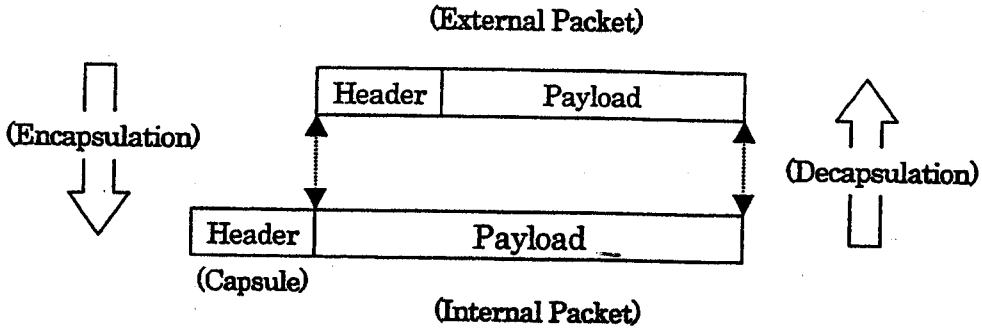

(External Packet)
(Encapsulation)
Header
Payload
(Decapsulation)
Header
Payload
(Capsule)
(Internal Packet)

FIG.3

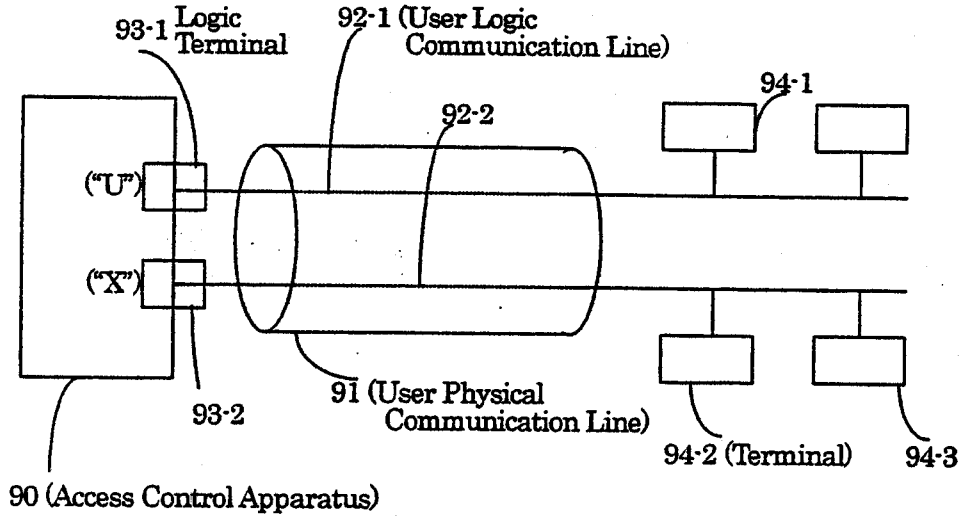

93-1 Logic Terminal
92-1 (User Logic Communication Line)
94-1
92-2
("U")
("X")
91 (User Physical Communication Line)
93-2
94-2 (Terminal)
94-3
90 (Access Control Apparatus)

FIG.4

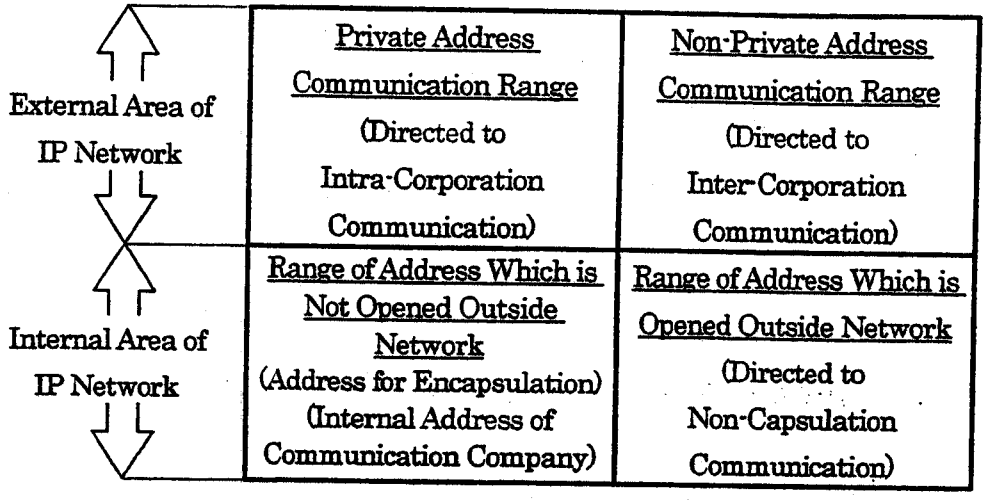

External Area of IP Network
Internal Area of IP Network
Private Address Communication Range (Directed to Intra-Corporation Communication)
Non-Private Address Communication Range (Directed to Inter-Corporation Communication)
Range of Address Which is Not Opened Outside Network (Address for Encapsulation) (Internal Address of Communication Company)
Range of Address Which is Opened Outside Network (Directed to Non-Capsulation Communication)

FIG.5

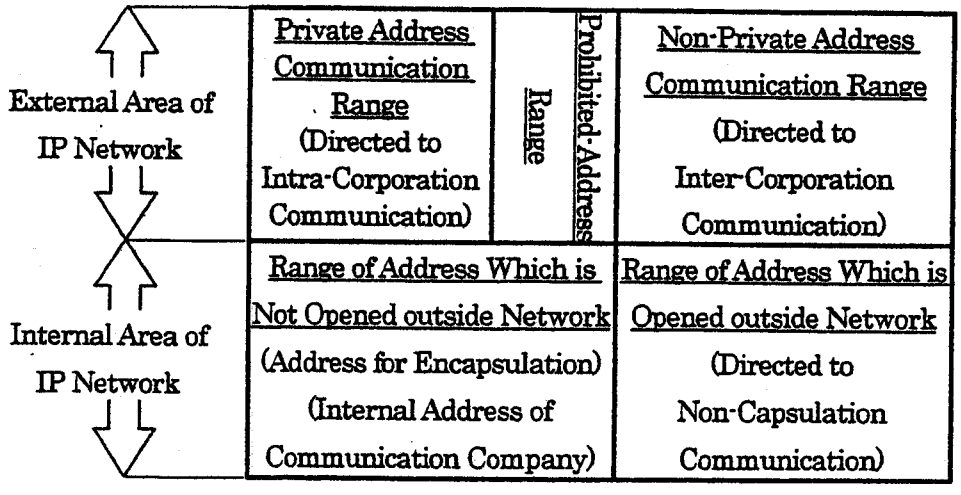

External Area of IP Network
Internal Area of IP Network
Private Address Communication Range (Directed to Intra-Corporation Communication)
Prohibited-Address Range
Non-Private Address Communication Range (Directed to Inter-Corporation Communication)
Range of Address Which is Not Opened outside Network (Address for Encapsulation) (Internal Address of Communication Company)
Range of Address Which is Opened outside Network (Directed to Non-Capsulation Communication)

Fig 6

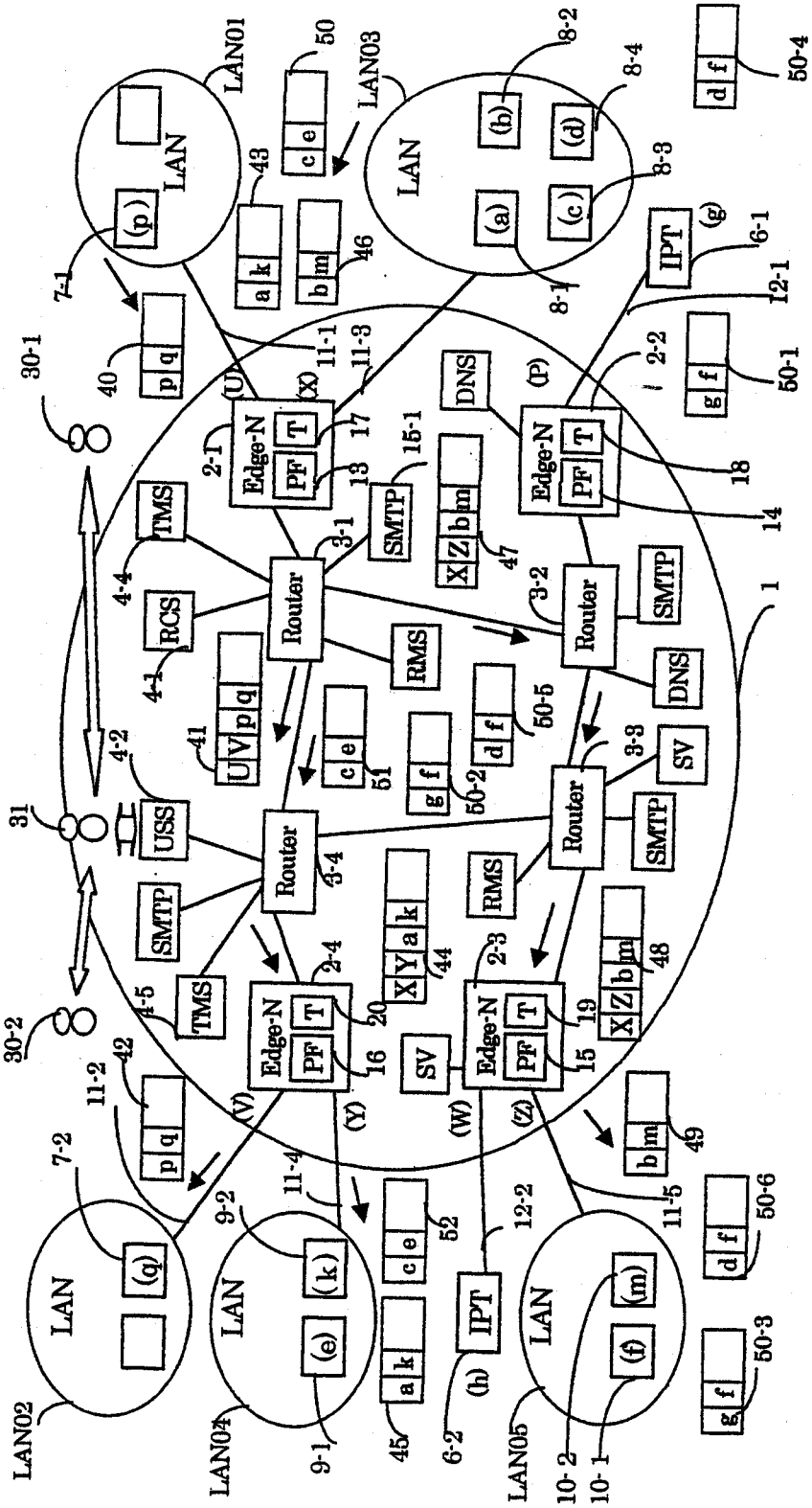

LAN01
LAN02
LAN03
LAN04
LAN05
LAN
Router
Edge-N
PF
T
TMS
RCS
USS
SMTP
RMS
SV
DNS
IPT
Fig 6

FIG.7

17

Internal Source Address	External Source Address	External Destination Address	Internal Destination Address	Request Identification	Priority Degree	Charge Identifier
U	—	—	V	3	4	Fa01
X	a	k	Y	1	2	Fa02
X	b	m	Z	1	2	Fa03
X	c	—	—	2	0	Fa04
X	d	f	—	2	0	Fa05
. .	. .	. .	. .	. .	. .	. .

FIG.8

18

Internal Source Address	External Source Address	External Destination Address	Internal Destination Address	Request Identification	Priority Degree	Charge Identifier
P	—	f	—	2	0	Fb01
. .	. .	. .	. .	. .	. .	. .

FIG.9

19

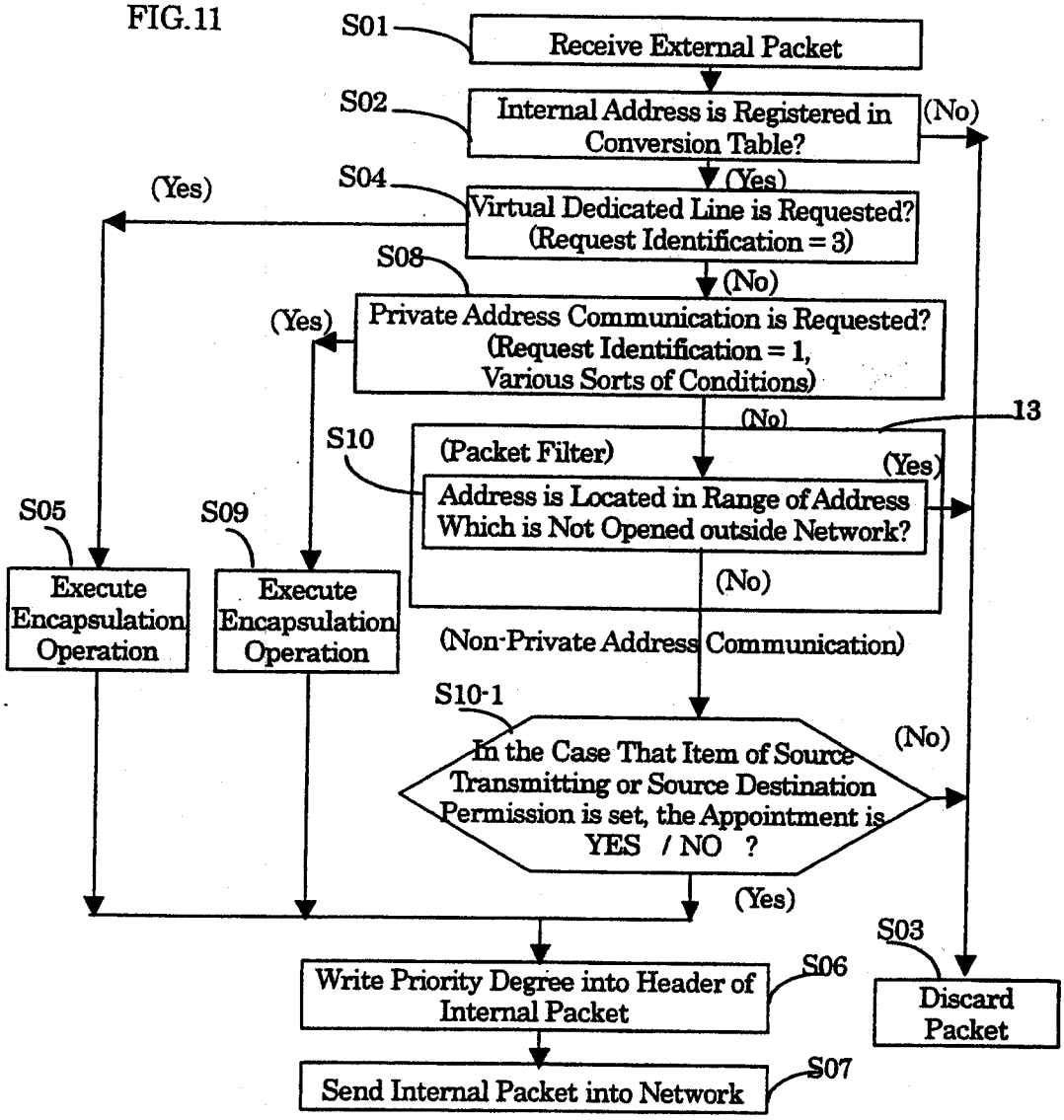
Internal Source Address	External Source Address	Source address mask	Destination address mask	External Destination Address	Internal Destination Address	Request Identification	Priority Degree	Charge Identifier
W	h	—	—	—	—	2	0	Fd01
Z	mx	MSK1	MKD1	bx	X	1	2	Fd02
Z	fx	MKS2	—	—	—	2	0	Fd03
. .	. .	. .	. .	. .	. .	. .	. .	. .

FIG.10

20

Internal Source Address	External Source Address	Permission to send	Permission to receive	Permission to dest.	External Dest. Address	Internal Dest. Address	Request Identification	Priority Degree	Charge Identifier
V	—	—	—	—	—	U	3	4	Fc01
Y	k	YES	YES	YES	a	X	1	2	Fc02
Y	e	YES	YES	—	—	—	2	0	Fc03
. .	. .	. .	. .	. .	. .	. .	. .	. .	. .

FIG.11


S01
Receive External Packet
S02
Internal Address is Registered in Conversion Table?
(No)
(Yes)
S04
Virtual Dedicated Line is Requested? (Request Identification = 3)
(Yes)
S08
(No)
Private Address Communication is Requested? (Request Identification = 1, Various Sorts of Conditions)
(Yes)
(No)
13
S10
(Packet Filter)
(Yes)
Address is Located in Range of Address Which is Not Opened outside Network?
(No)
S05
S09
Execute Encapsulation Operation
Execute Encapsulation Operation
(Non-Private Address Communication)
S10-1
In the Case That Item of Source Transmitting or Source Destination Permission is set, the Appointment is YES / NO ?
(No)
(Yes)
S03
Discard Packet
S06
Write Priority Degree into Header of Internal Packet
S07
Send Internal Packet into Network

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FIG.12

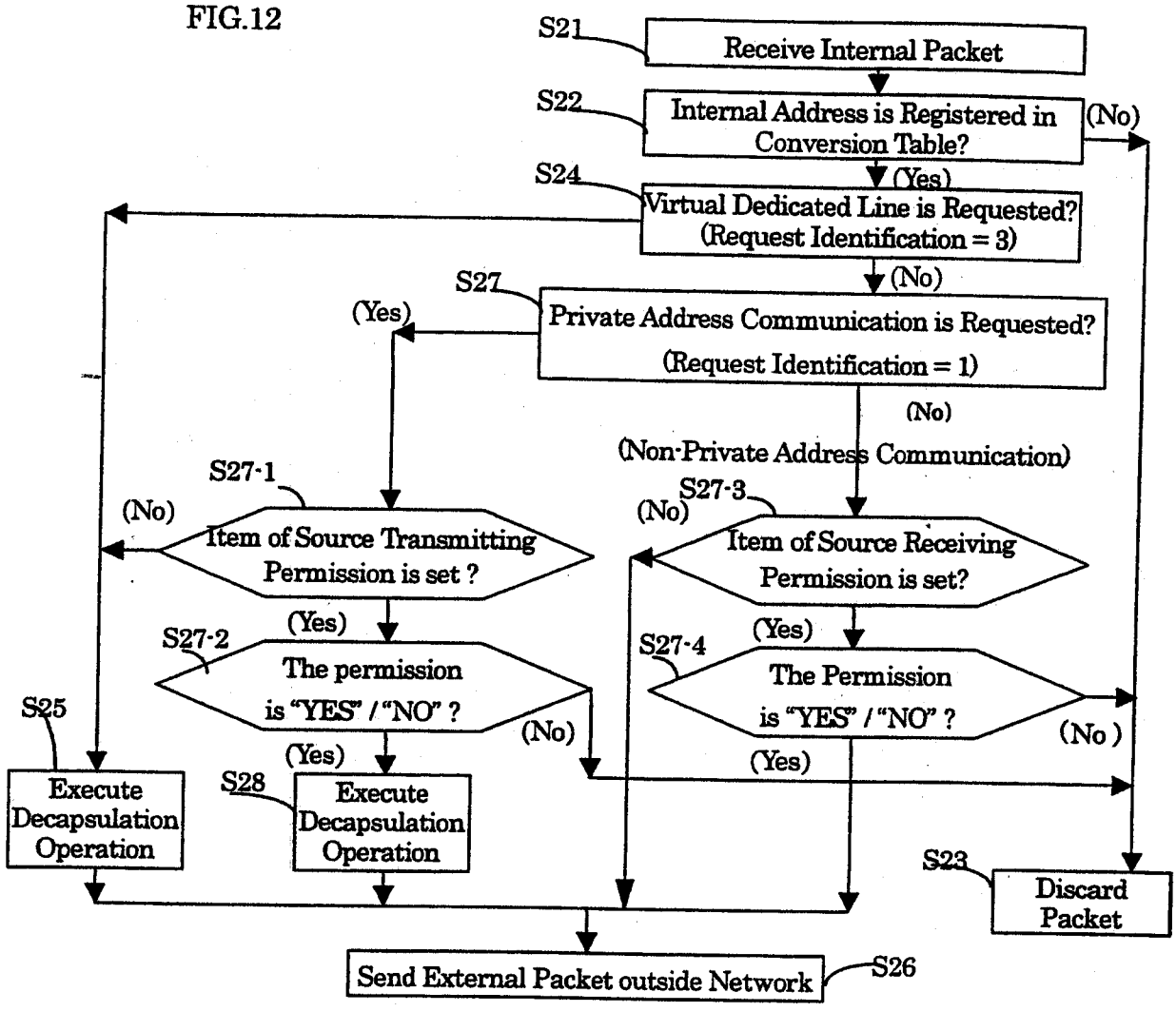


FIG.13

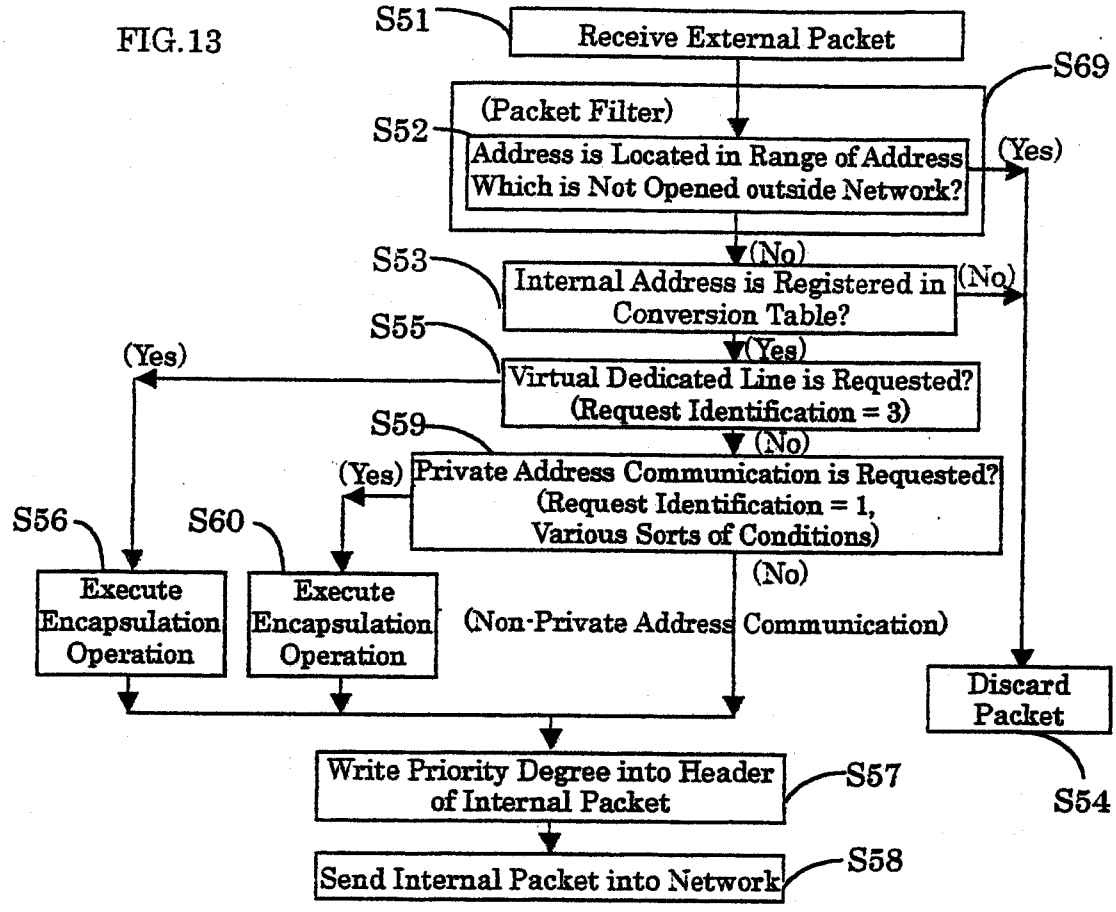

S51
Receive External Packet
S69
(Packet Filter)
S52
Address is Located in Range of Address Which is Not Opened outside Network?
(Yes)
(No)
S53
Internal Address is Registered in Conversion Table?
(No)
(Yes)
S55
Virtual Dedicated Line is Requested? (Request Identification = 3)
(Yes)
(No)
S59
Private Address Communication is Requested? (Request Identification = 1, Various Sorts of Conditions)
(Yes)
(No)
S56
S60
Execute Encapsulation Operation
Execute Encapsulation Operation
(Non-Private Address Communication)
Discard Packet
S54
Write Priority Degree into Header of Internal Packet
S57
Send Internal Packet into Network
S58

FIG.14

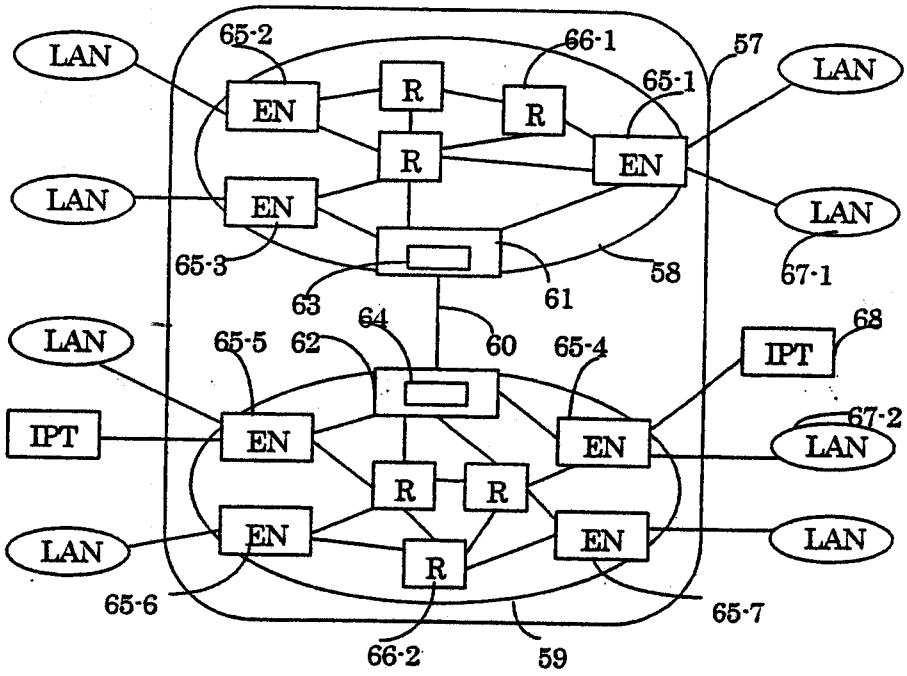

LAN
65-2
66-1
57
LAN
EN
R
R
65-1
R
EN
LAN
EN
LAN
65-3
58
67-1
63
61
64
LAN
65-5
62
60
65-4
68
IPT
IPT
EN
EN
67-2
LAN
R
R
LAN
EN
EN
LAN
R
65-6
65-7
66-2
59

FIG.15

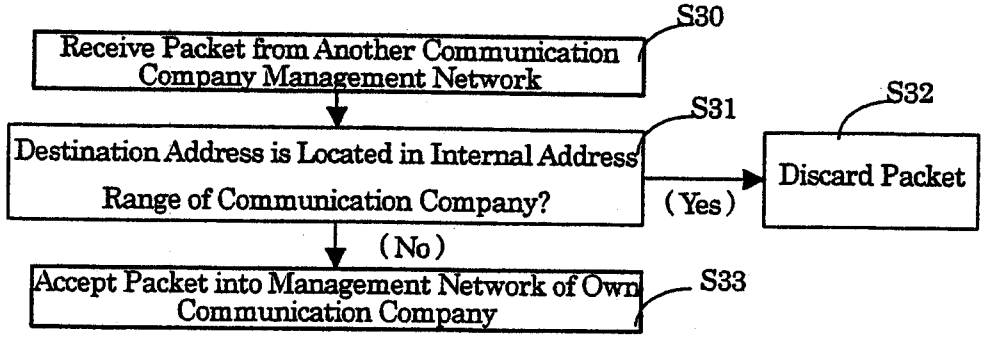

S30
Receive Packet from Another Communication Company Management Network
S31
S32
Destination Address is Located in Internal Address Range of Communication Company?
(Yes)
Discard Packet
(No)
Accept Packet into Management Network of Own Communication Company
S33

FIG.16

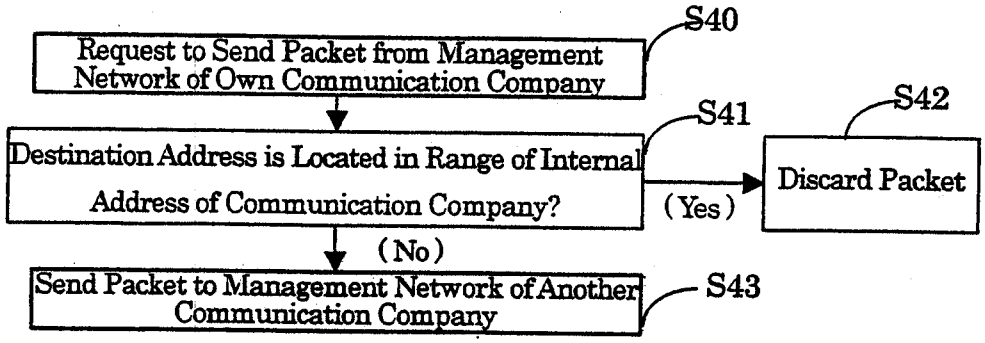
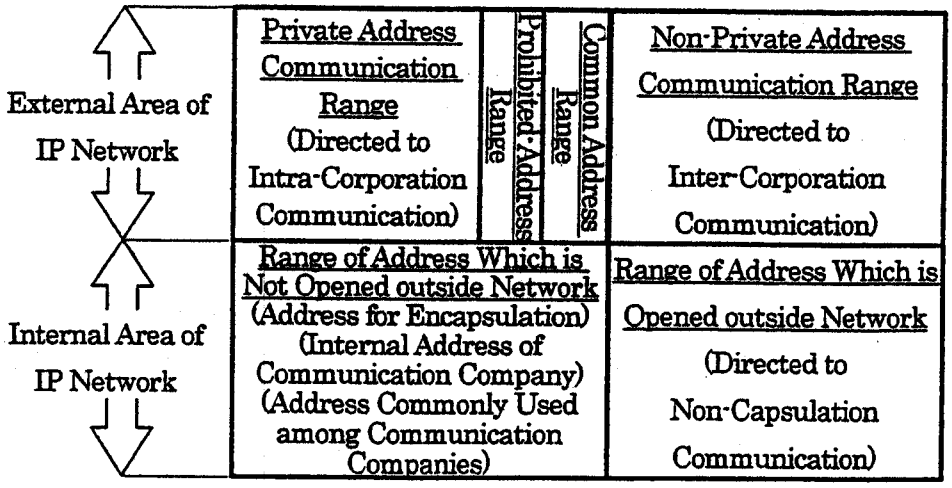
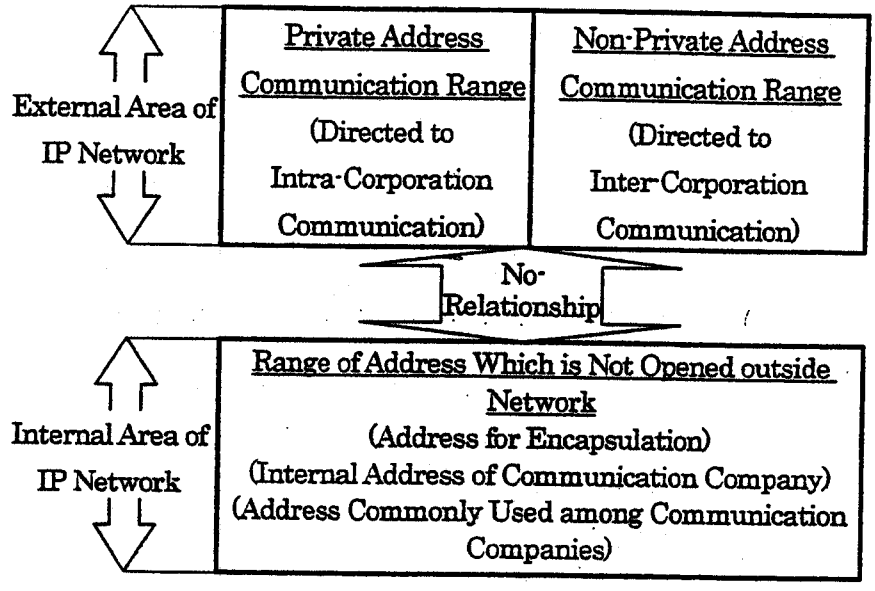

Request to Send Packet from Management Network of Own Communication Company
S40
Destination Address is Located in Range of Internal Address of Communication Company?
S41
(Yes)
Discard Packet
S42
(No)
Send Packet to Management Network of Another Communication Company
S43

FIG.17


External Area of IP Network
Internal Area of IP Network
Private Address Communication Range (Directed to Intra-Corporation Communication)
Prohibited Address Range
Common Address Range
Non-Private Address Communication Range (Directed to Inter-Corporation Communication)
Range of Address Which is Not Opened outside Network (Address for Encapsulation) (Internal Address of Communication Company) (Address Commonly Used among Communication Companies)
Range of Address Which is Opened outside Network (Directed to Non-Capsulation Communication)

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FIG.18



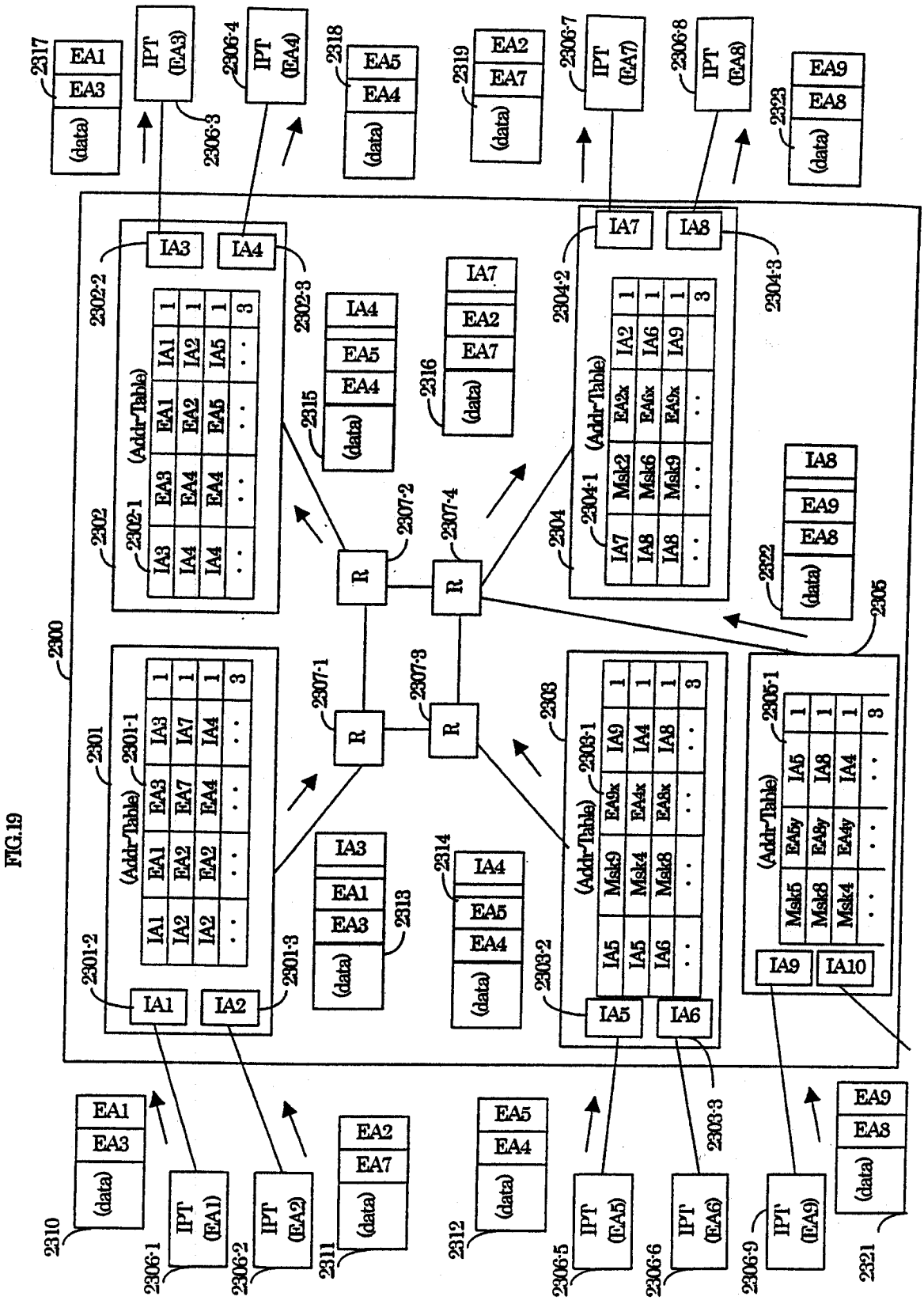

2317
EA1
EA3
(data)
IPT (EA3)
2306-3
2306-4
IPT (EA4)
2318
EA5
EA4
(data)
2319
EA2
EA7
(data)
2306-7
IPT (EA7)
2306-8
IPT (EA8)
2323
EA9
EA8
(data)
2300
2302
2302-1
(Addr-Table)
2302-2
2302-3
IA3
IA4
2315
IA4
EA5
EA4
(data)
2316
IA7
EA2
EA7
(data)
2304
2304-1
(Addr-Table)
2304-2
2304-3
IA7
IA8
2322
IA8
EA9
EA8
(data)
2305
2305-1
(Addr-Table)
2307-1
2307-2
2307-3
2307-4
R
2301
2301-1
(Addr-Table)
2301-2
2301-3
IA1
IA2
2313
IA3
EA1
EA3
(data)
2314
IA4
EA5
EA4
(data)
2303
2303-1
(Addr-Table)
2303-2
IA5
IA6
IA9
IA10
2310
EA1
EA3
(data)
2306-1
IPT (EA1)
2306-2
IPT (EA2)
2311
EA2
EA7
(data)
2312
EA5
EA4
(data)
2306-5
IPT (EA5)
2306-6
IPT (EA6)
2306-9
IPT (EA9)
2321
EA9
EA8
(data)

FIG.19

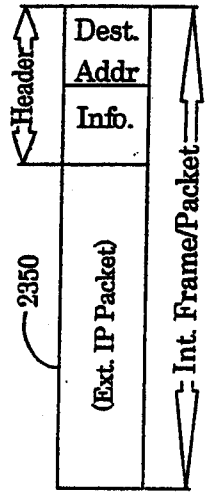

2350
(Ext. IP Packet)
Header
Dest.
Addr
Info.
Int. Frame/Packet

FIG.20

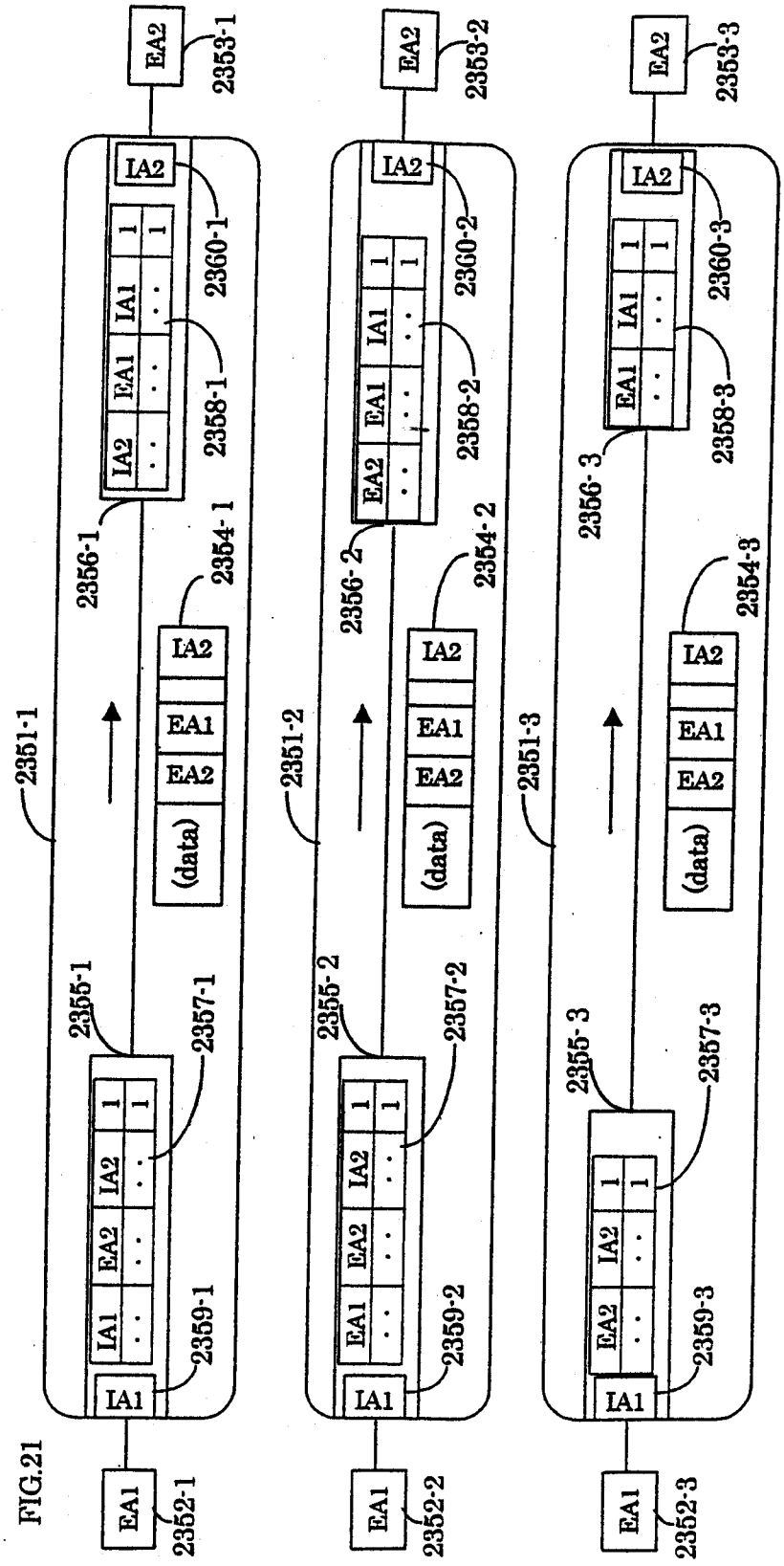

EA2
2353-1
IA2
2360-1
IA2
EA2
EA1
IA1
2358-1
2356-1
2354-1
IA2
EA1
EA2
(data)
2351-1
2355-1
2357-1
IA1
EA2
IA2
2359-1
EA1
2352-1
EA2
2353-2
IA2
2360-2
2358-2
2356-2
2354-2
2351-2
2355-2
2357-2
2359-2
2352-2
EA2
2353-3
IA2
2360-3
2358-3
2356-3
2354-3
2351-3
2355-3
2357-3
2359-3
2352-3

FIG.21

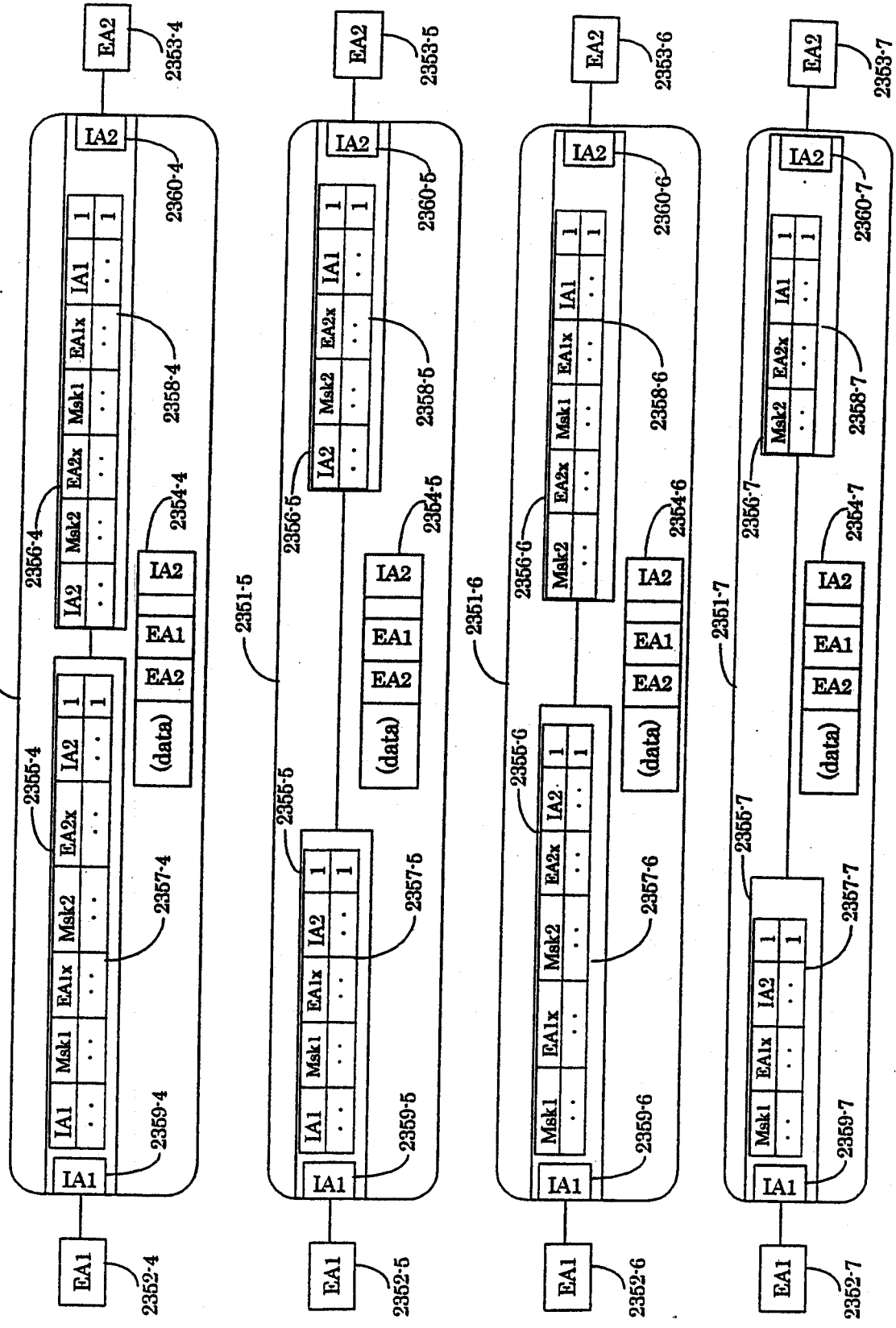

EA2
2353-4
IA2
2360-4
2356-4
2358-4
2354-4
IA2
EA1
EA2
(data)
2351-4
2355-4
2357-4
2359-4
IA1
EA1
2352-4
EA2
2353-5
IA2
2360-5
2356-5
2358-5
2364-5
IA2
EA1
EA2
(data)
2351-5
2355-5
2357-5
2359-5
IA1
EA1
2352-5
EA2
2353-6
IA2
2360-6
2356-6
2358-6
2354-6
IA2
EA1
EA2
(data)
2351-6
2355-6
2357-6
2359-6
IA1
EA1
2352-6
EA2
2353-7
IA2
2360-7
2356-7
2358-7
2354-7
IA2
EA1
EA2
(data)
2351-7
2355-7
2357-7
2359-7
IA1
EA1
2352-7

FIG.22

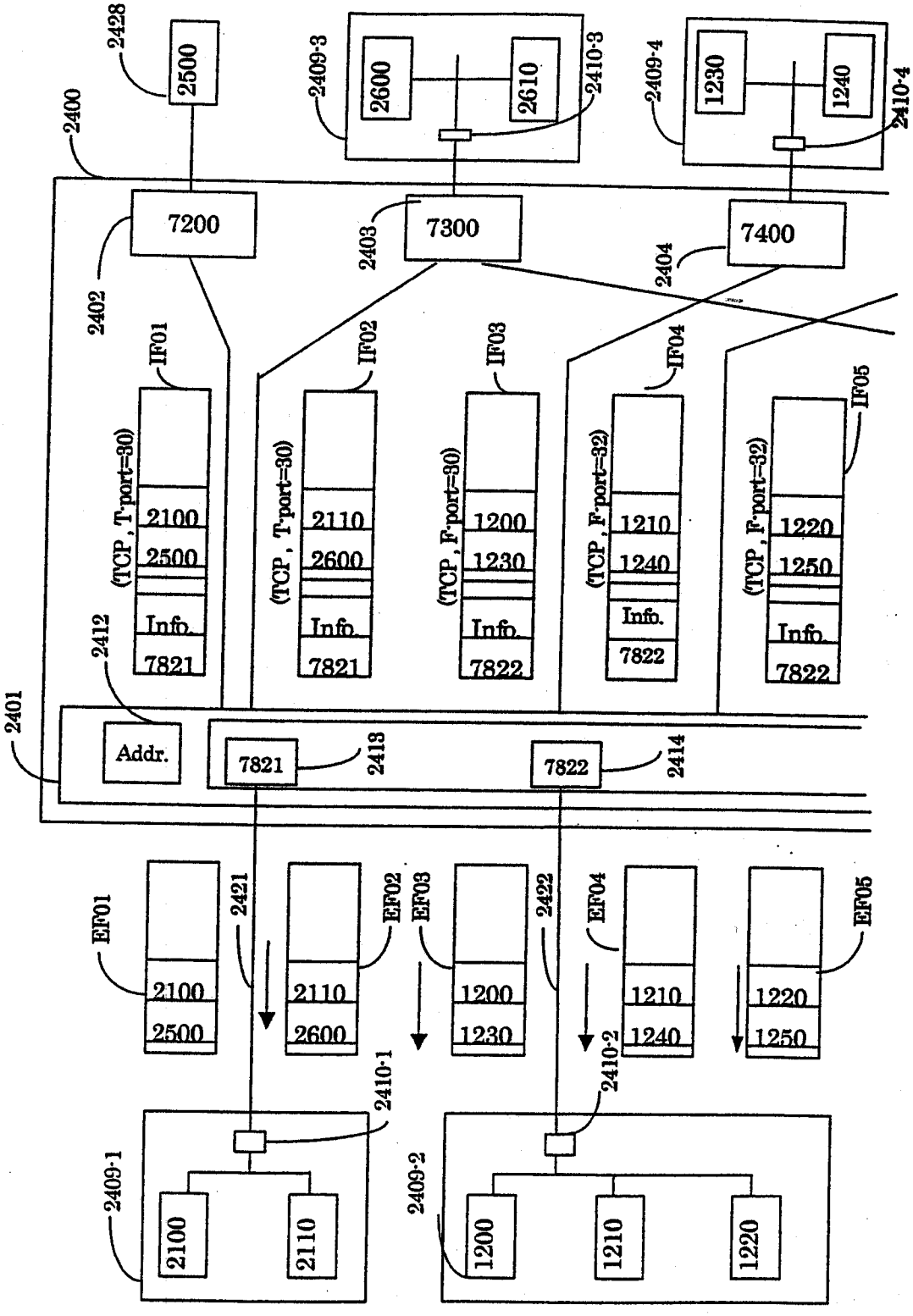

2428
2500
2409-3
2600
2610
2410-3
2409-4
1230
1240
2410-4
2400
7200
7300
7400
2403
2404
2402
IF01
IF02
IF03
IF04
IF05
(TCP, T-port=30)
2100
2500
Info.
7821
(TCP, T-port=30)
2110
2600
Info.
7821
(TCP, F-port=30)
1200
1230
Info.
7822
(TCP, F-port=32)
1210
1240
Info.
7822
(TCP, F-port=32)
1220
1250
Info.
7822
2412
2401
Addr.
7821
2418
7822
2414
EF01
2421
EF02
EF03
2422
EF04
EF05
2100
2500
2110
2600
1200
1230
1210
1240
1220
1250
2410-1
2410-2
2409-1
2100
2110
2409-2
1200
1210
1220

FIG.23

FIG.24

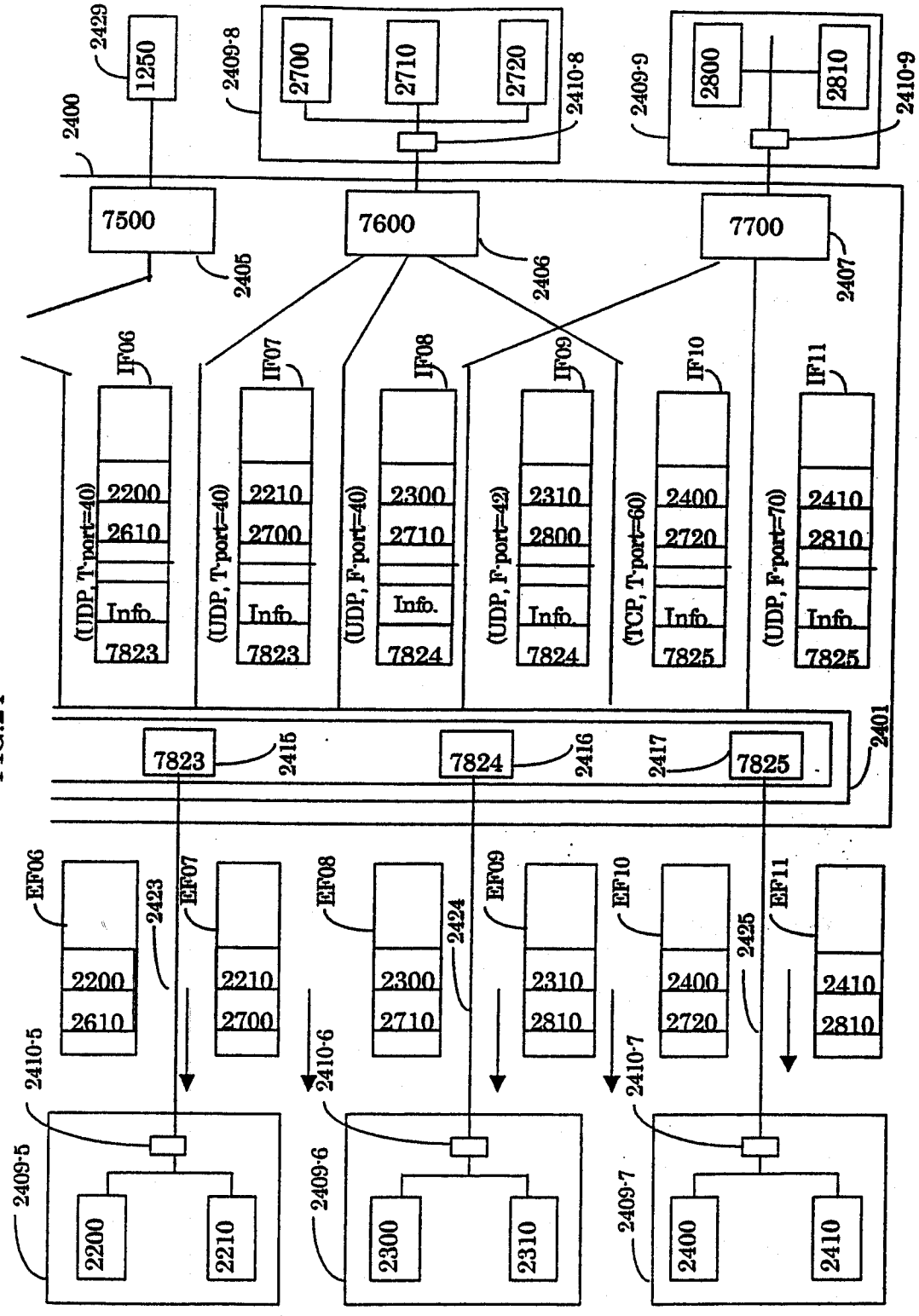

2429
1250
2400
2409-8
2700
2710
2720
2410-8
2409-9
2800
2810
2410-9
7500
7600
7700
2405
2406
2407
IF06
IF07
IF08
IF09
IF10
IF11
(UDP, T-port=40)
2200
2610
Info.
7823
(UDP, T-port=40)
2210
2700
Info.
7823
(UDP, F-port=40)
2300
2710
Info.
7824
(UDP, F-port=42)
2310
2800
Info.
7824
(TCP, T-port=60)
2400
2720
Info.
7825
(UDP, F-port=70)
2410
2810
Info.
7825
2401
7823
2415
7824
2416
2417
7825
EF06
2423
EF07
EF08
2424
EF09
EF10
2425
EF11
2200
2610
2210
2700
2300
2710
2310
2810
2400
2720
2410
2810
2410-5
2410-6
2410-7
2409-5
2409-6
2409-7
2200
2210
2300
2310
2400
2410

FIG.27

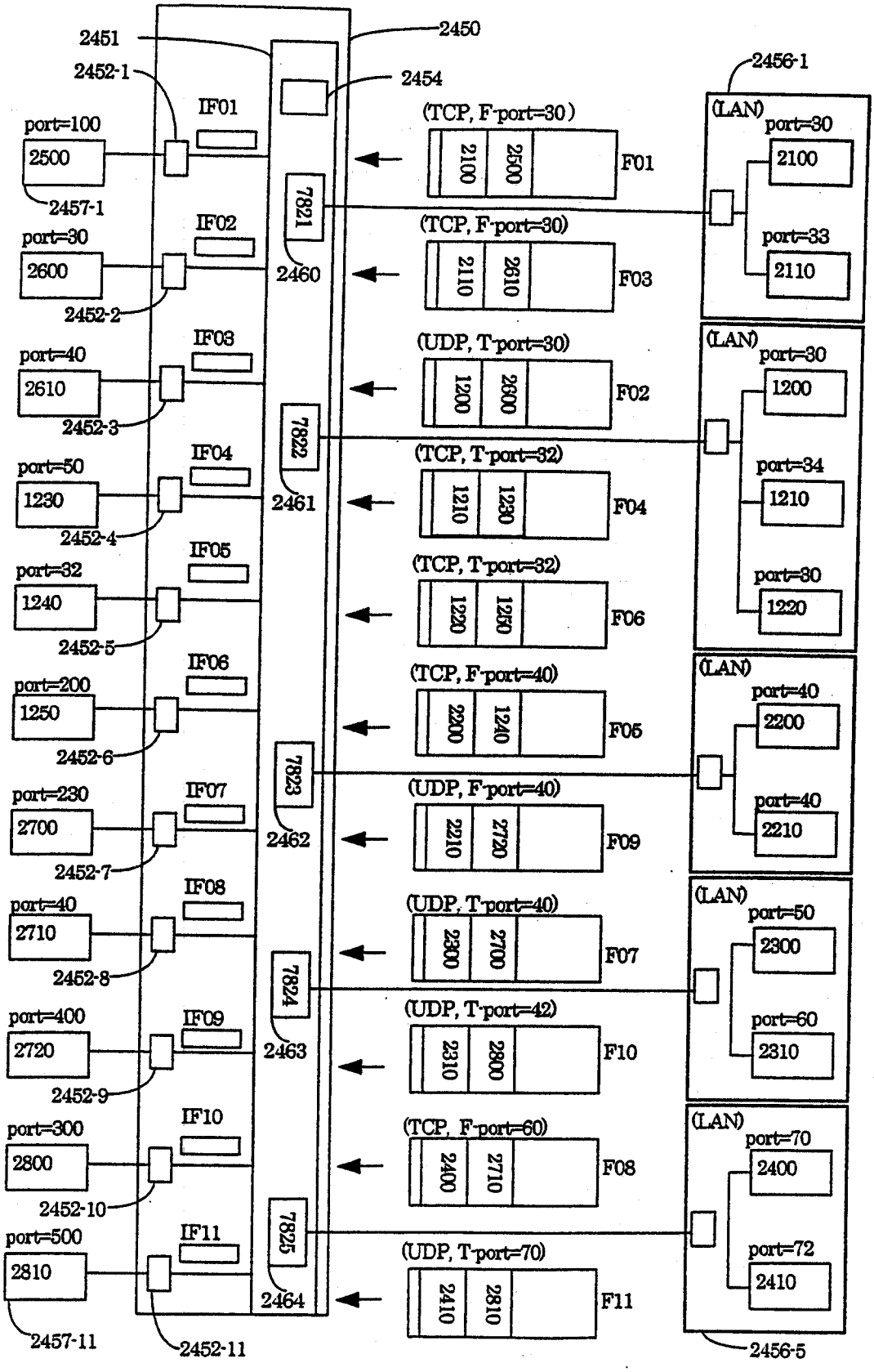

2451
2452-1
2450
2454
2456-1
IF01
port=100
2500
2457-1
(TCP, F-port=30)
2100
2500
F01
(LAN)
port=30
2100
7821
port=33
2110
IF02
port=30
2600
2460
2452-2
(TCP, F-port=30)
2110
2610
F03
IF03
port=40
2610
2452-3
(UDP, T-port=30)
1200
2600
F02
(LAN)
port=30
1200
7822
port=34
1210
IF04
port=50
1230
2461
2452-4
(TCP, T-port=32)
1210
1230
F04
port=30
1220
IF05
port=32
1240
2452-5
(TCP, T-port=32)
1220
1250
F06
IF06
port=200
1250
2452-6
(TCP, F-port=40)
2200
1240
F05
(LAN)
port=40
2200
7823
port=40
2210
IF07
port=230
2700
2462
2452-7
(UDP, F-port=40)
2210
2720
F09
IF08
port=40
2710
2452-8
(UDP, T-port=40)
2300
2700
F07
(LAN)
port=50
2300
7824
port=60
2310
IF09
port=400
2720
2463
2452-9
(UDP, T-port=42)
2310
2800
F10
IF10
port=300
2800
2452-10
(TCP, F-port=60)
2400
2710
F08
(LAN)
port=70
2400
7825
port=72
2410
IF11
port=500
2810
2464
2457-11
2452-11
(UDP, T-port=70)
2410
2810
F11
2456-5

FIG.25

2412

(Address Management Table) 2412-1

Internal Source Address	External Source Address	External Destination Address	Internal Destination Address	Request Identification	Packet Reception Priority Symbol	Closed-Area Identifier
7821	2100	2500	7200	1	pr-7821	1
7821	2110	2600	7300	1	pr-7821	1
7822	1200	1230	7400	1	pr-7822	2
7822	1210	1240	7400	1	pr-7822	2
7822	1220	1250	7500	1	pr-7823	3
7823	2200	2610	7300	1	pr-7823	3
7823	2210	2700	7600	1	pr-7824	3
7824	2300	2710	7600	1	pr-7824	3
7824	2310	2800	7700	1	pr-7825	3
7825	2400	2720	7600	1	pr-7825	3
7825	2410	2810	7700	1	pr-7825	3
. .	. .	. .	. .	3	. .	. .

2412-2

Packet Reception Priority Symbol	Protocol Priority Degree	TCP Socket Priority Degree	UDP Socket Priority Degree
pr-7821	p-1	t-1	NULL
pr-7822	p-1	t-2	NULL
pr-7823	p-2	NULL	u-1
pr-7824	p-2	NULL	u-2
pr-7825	p-1	t-3	u-3
. .	. .	. .	. .

2412-3

Protocol Priority Degree (High Priority Degree - Low Priority Degree)	
p-1	TCP, UDP, ICMP, IGMP
p-2	UDP, TCP, ICMP, IGMP
p-3	ICMP, IGMP, UDP, TCP,

2412-4

TCP Socket Priority Degree	
t-1	sk-1, sk-7
t-2	sk-2
t-3	sk-5

2412-5

UDP Socket Priority Degree	
u-1	sk-3, sk-8
u-2	sk-4
u-3	sk-6

2412-6

Socket Designation			
Socket Code	From / To	IP-Address	port -No.
sk-1	To	2100	30
sk-2	From	1240	32
sk-3	To	2200	40
sk-4	From	2710	40

2412-7

Socket Designation			
Socket Code	From / To	IP-Address	port -No.
sk-5	To	2400	50
sk-6	From	2810	52
sk-7	From	2600	130
sk-8	From	2700	140

FIG.26

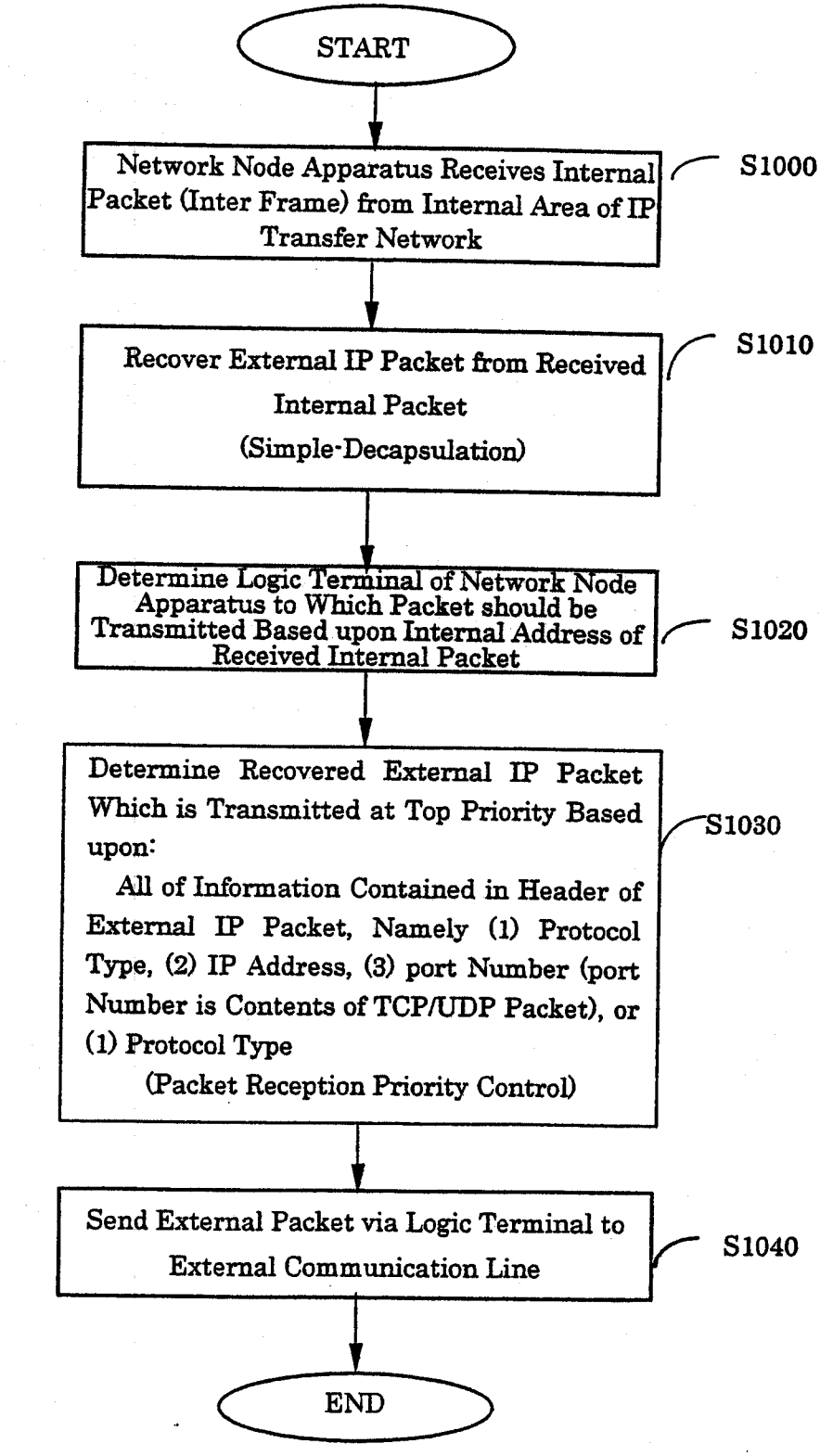

START
Network Node Apparatus Receives Internal Packet (Inter Frame) from Internal Area of IP Transfer Network
S1000
Recover External IP Packet from Received Internal Packet (Simple-Decapsulation)
S1010
Determine Logic Terminal of Network Node Apparatus to Which Packet should be Transmitted Based upon Internal Address of Received Internal Packet
S1020
Determine Recovered External IP Packet Which is Transmitted at Top Priority Based upon:
All of Information Contained in Header of External IP Packet, Namely (1) Protocol Type, (2) IP Address, (3) port Number (port Number is Contents of TCP/UDP Packet), or (1) Protocol Type
(Packet Reception Priority Control)
S1030
Send External Packet via Logic Terminal to External Communication Line
S1040
END

FIG.28

2454

(Address Management Table)

2454-1

Internal Source Address	External Source Address	External Destination Address	Internal Destination Address	Request Identification	Packet Transmission Priority Symbol	Closed-Area Identifier
7821	2100	2500	7200	1	ps-7200	2
7821	2110	2610	7300	1	ps-7300	2
7822	1200	2600	7201	1	ps-7200	2
7822	1210	1230	7301	1	ps-7300	2
7822	1220	1250	7401	1	ps-7400	2
7823	2200	1240	7400	1	ps-7400	2
7823	2210	2720	7600	1	ps-7600	5
7824	2300	2700	7500	1	ps-7500	5
7824	2310	2800	7601	1	ps-7600	5
7825	2400	2710	7501	1	ps-7500	5
7825	2410	2810	7602	1	ps-7600	5
. .	. .	. .	. .	3	. .	. .

2454-2

Packet Transmission Priority Symbol	Protocol Priority Degree	TCP Socket Priority Degree	UDP Socket Priority Degree
ps-7200	p-21	t-21	NULL
ps-7300	p-21	t-22	NULL
ps-7400	p-22	NULL	u-21
ps-7500	p-22	NULL	u-22
ps-7600	p-21	t-23	u-23
ps-0000	NULL	NULL	NULL

2454-3

Protocol Priority Degree (High Priority Degree - Low Priority Degree)	
p-21	TCP, UDP, ICMP, IGMP
p-22	UDP, TCP, ICMP, IGMP
p-23	ICMP, IGMP, UDP, TCP,

2454-4

TCP Socket Priority Degree	
t-21	sk-21, sk-27
t-22	sk-22
t-23	sk-25

2454-5

UDP Socket Priority Degree	
u-21	sk-23, sk-26
u-22	sk-24
u-23	sk-28, sk-24

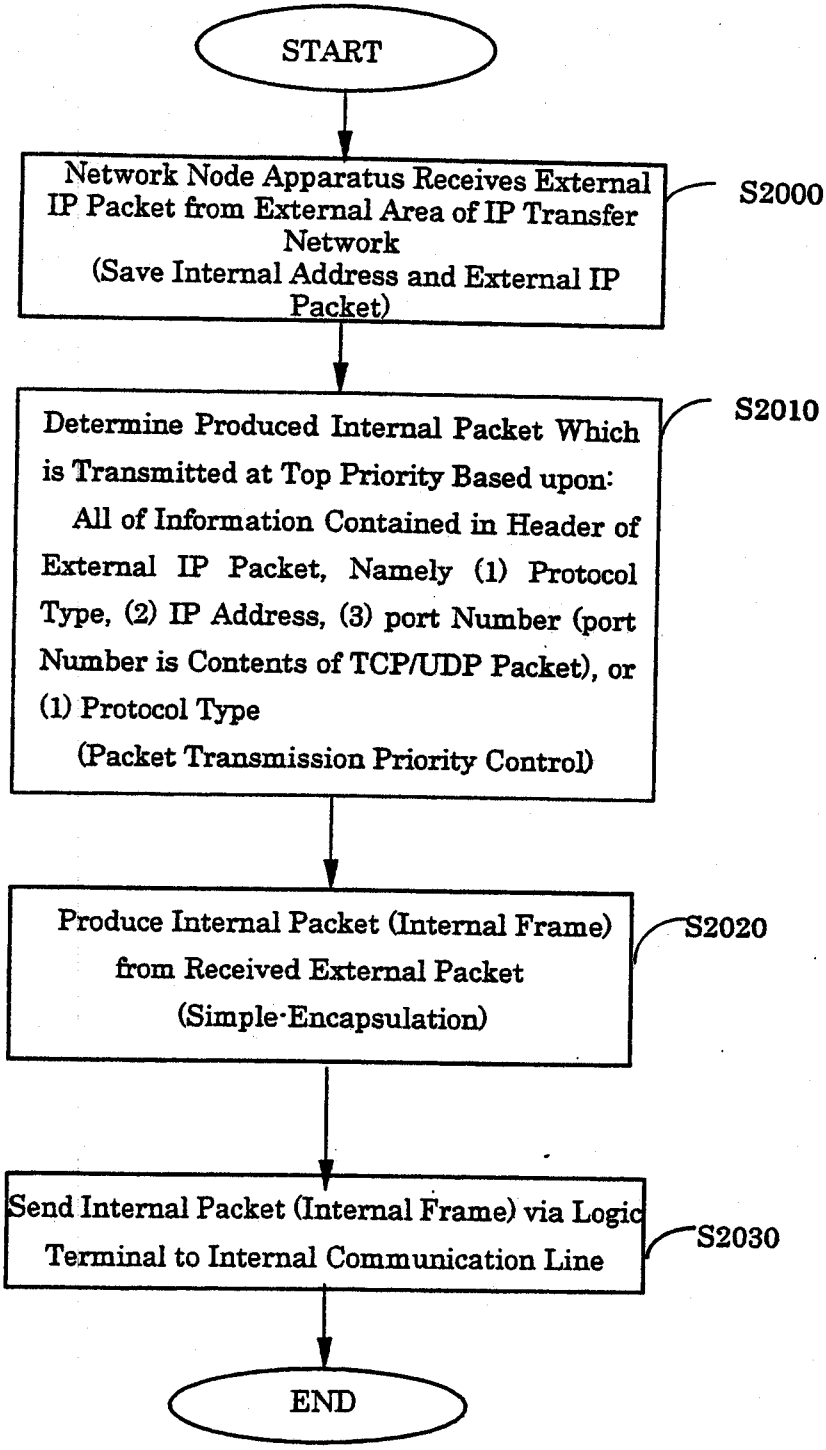
2454-6

Socket Designation			
Socket Code	From / To	IP-Address	port-No.
sk-21	From	2110	30
sk-22	To	1250	32
sk-23	From	NULL	40
sk-24	From	2210	40

2454-7

Socket Designation			
Socket Code	From / To	IP-Address	port-No.
sk-25	From	2400	60
sk-26	To	NULL	42
sk-27	To	2600	130
sk-28	From	2410	70

FIG.29


START
Network Node Apparatus Receives External IP Packet from External Area of IP Transfer Network
(Save Internal Address and External IP Packet)
S2000
Determine Produced Internal Packet Which is Transmitted at Top Priority Based upon:
All of Information Contained in Header of External IP Packet, Namely (1) Protocol Type, (2) IP Address, (3) port Number (port Number is Contents of TCP/UDP Packet), or (1) Protocol Type
(Packet Transmission Priority Control)
S2010
Produce Internal Packet (Internal Frame) from Received External Packet
(Simple·Encapsulation)
S2020
Send Internal Packet (Internal Frame) via Logic Terminal to Internal Communication Line
S2030
END