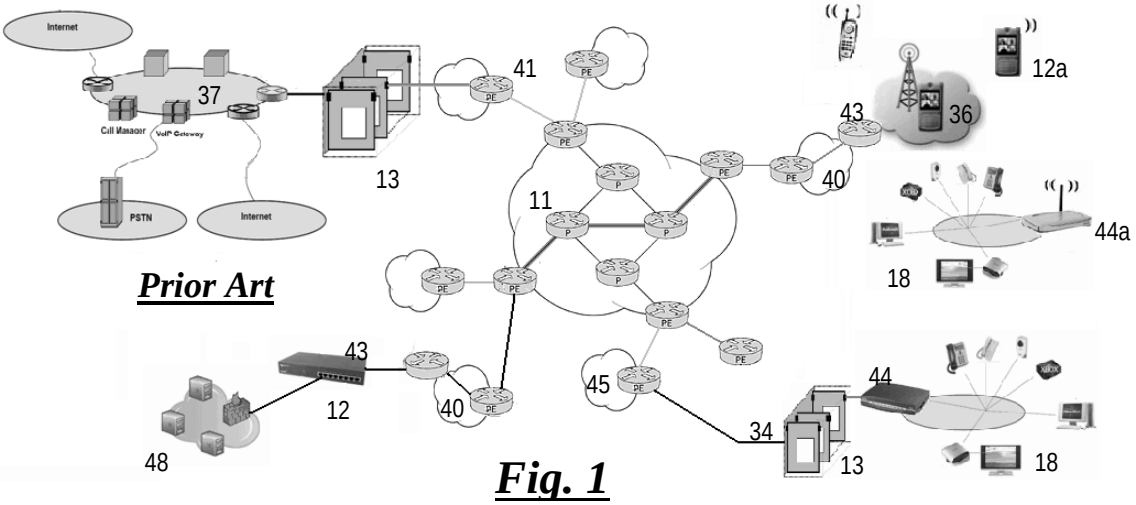


Prior Art

Fig. 1

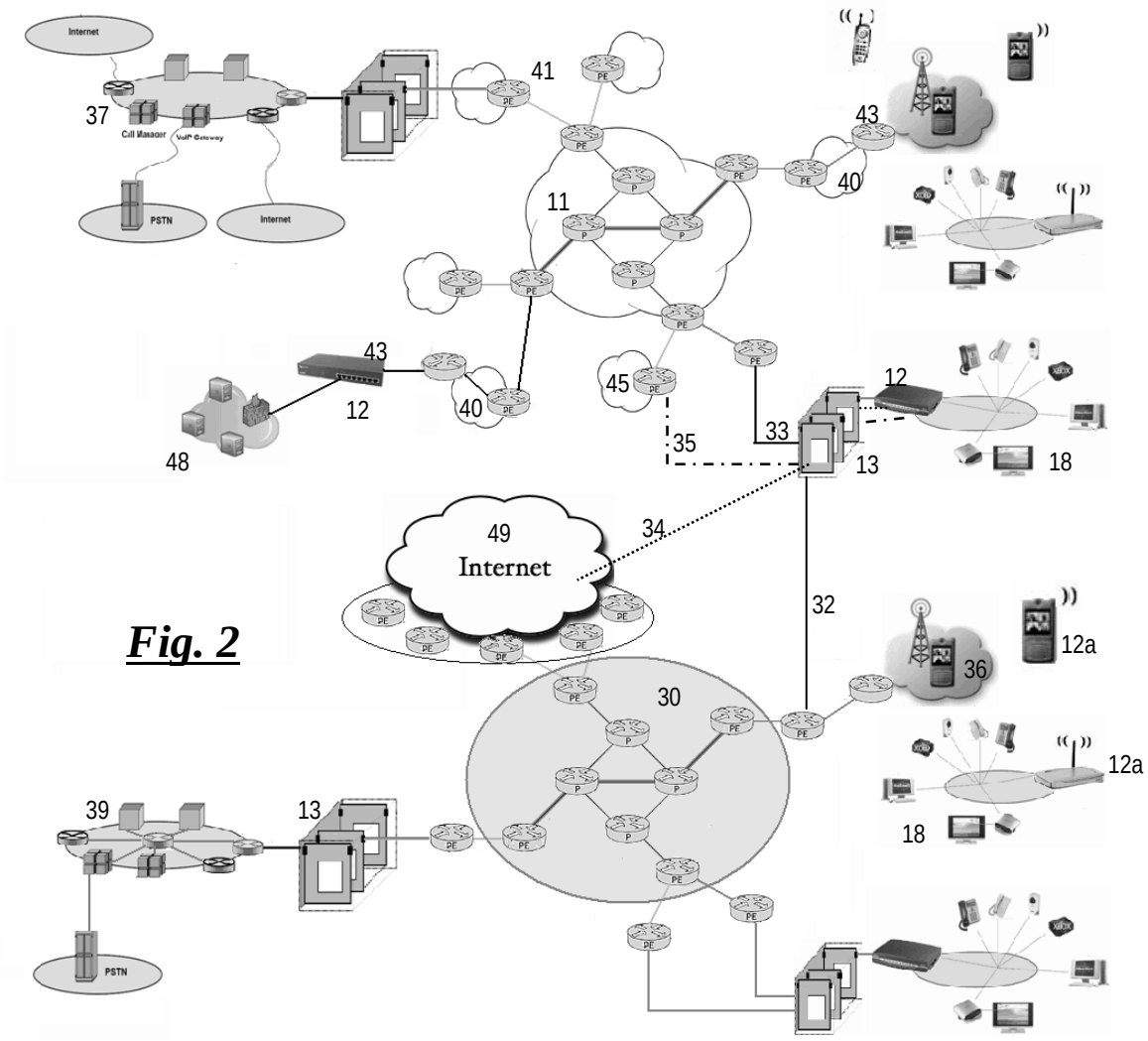


Fig. 2

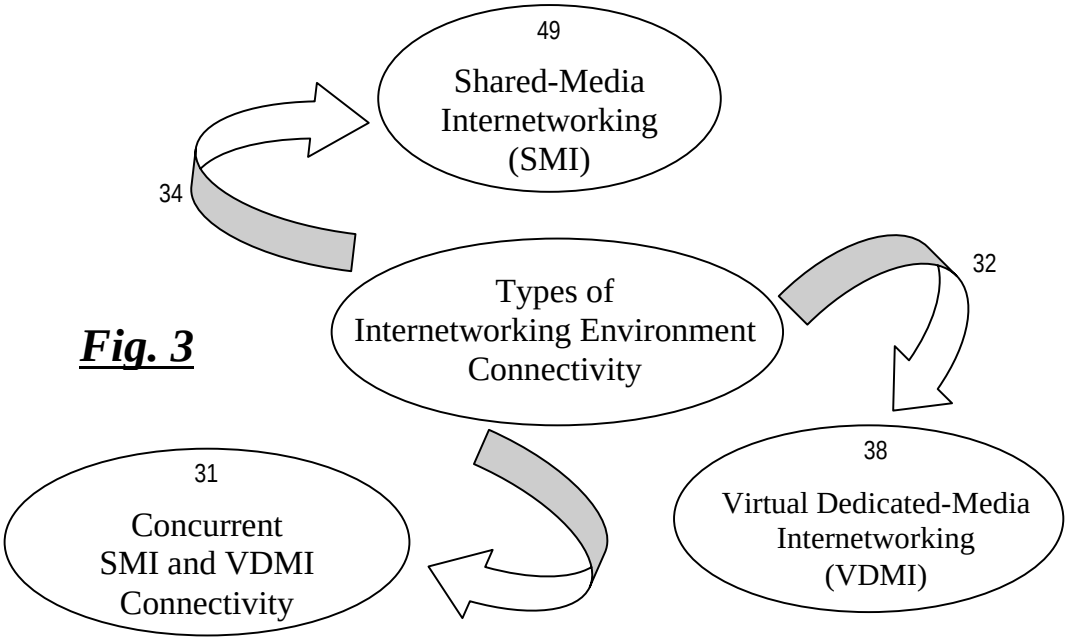
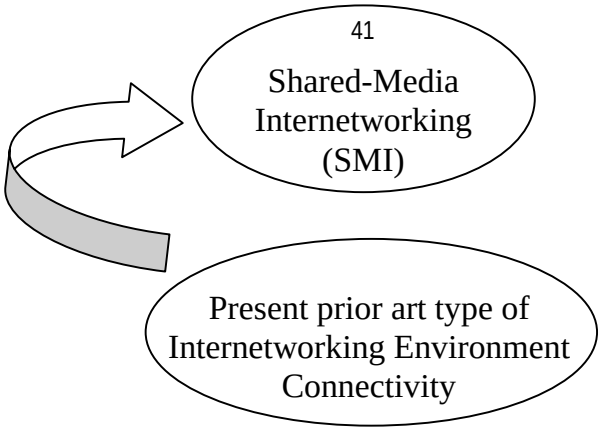

49
Shared-Media
Internetworking
(SMI)
34
Types of
Internetworking Environment
Connectivity
32
38
Virtual Dedicated-Media
Internetworking
(VDMI)
31
Concurrent
SMI and VDMI
Connectivity

Fig. 3

Fig. 4


41
Shared-Media
Internetworking
(SMI)
Present prior art type of
Internetworking Environment
Connectivity

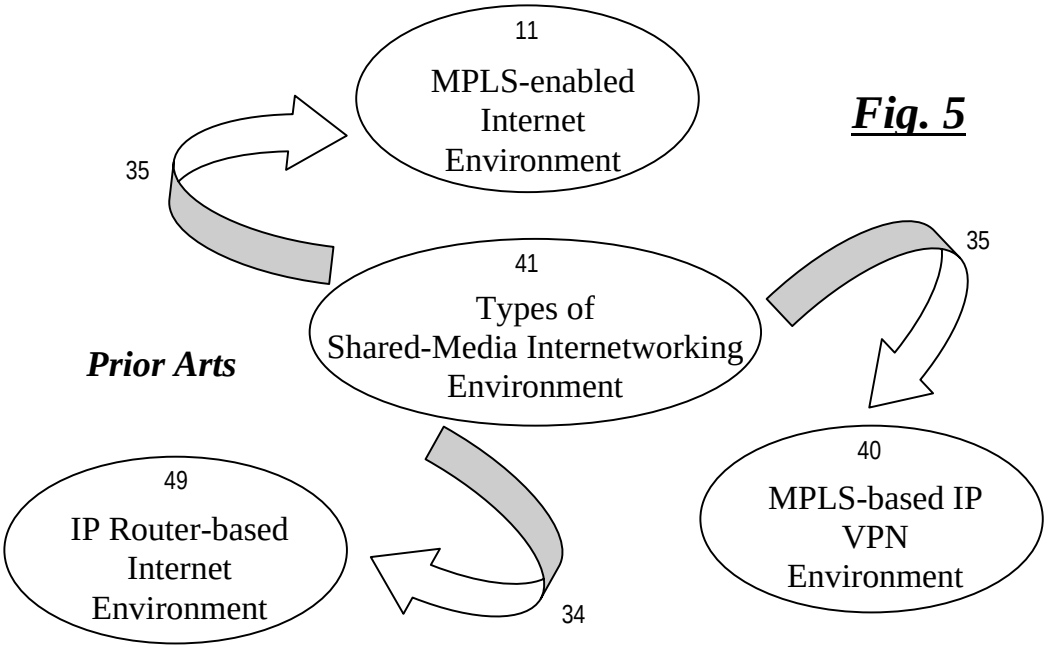
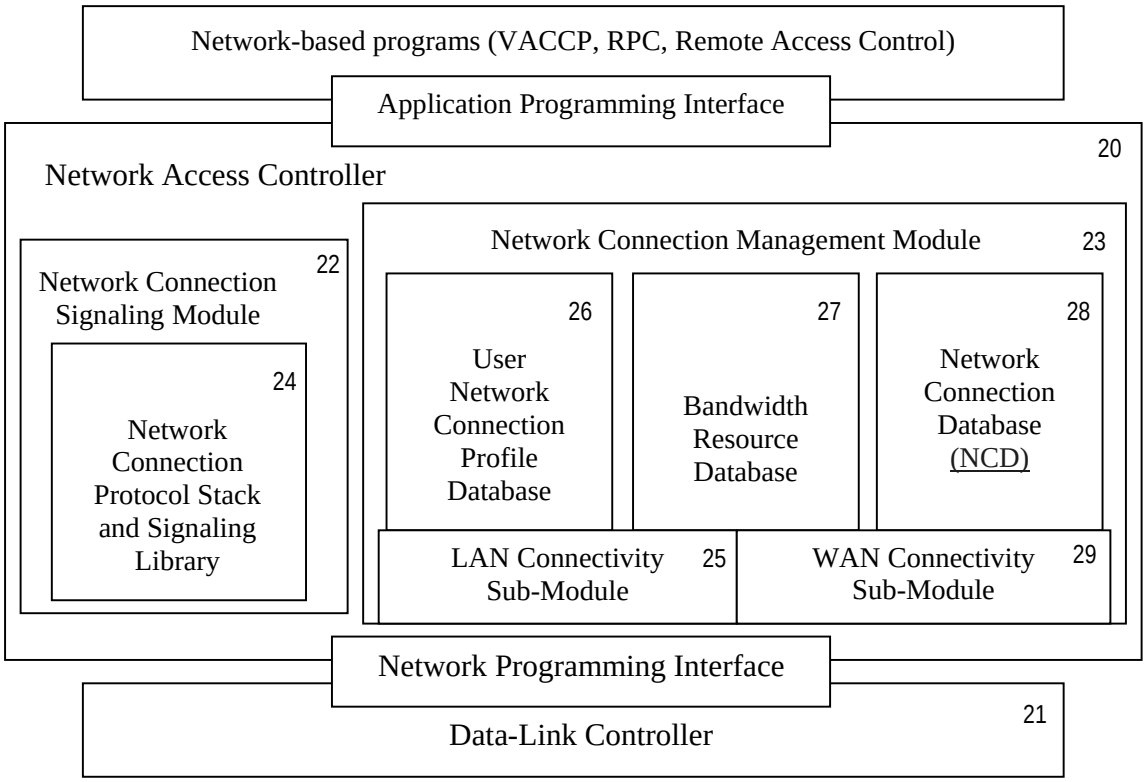

11
MPLS-enabled Internet Environment
35
41
Types of Shared-Media Internetworking Environment
35
Prior Arts
40
MPLS-based IP VPN Environment
49
IP Router-based Internet Environment
34

Fig. 5

Fig. 6


Network-based programs (VACCP, RPC, Remote Access Control)
Application Programming Interface
20
Network Access Controller
Network Connection Management Module
23
22
Network Connection Signaling Module
26
User Network Connection Profile Database
27
Bandwidth Resource Database
28
Network Connection Database (NCD)
24
Network Connection Protocol Stack and Signaling Library
LAN Connectivity Sub-Module
25
WAN Connectivity Sub-Module
29
Network Programming Interface
21
Data-Link Controller

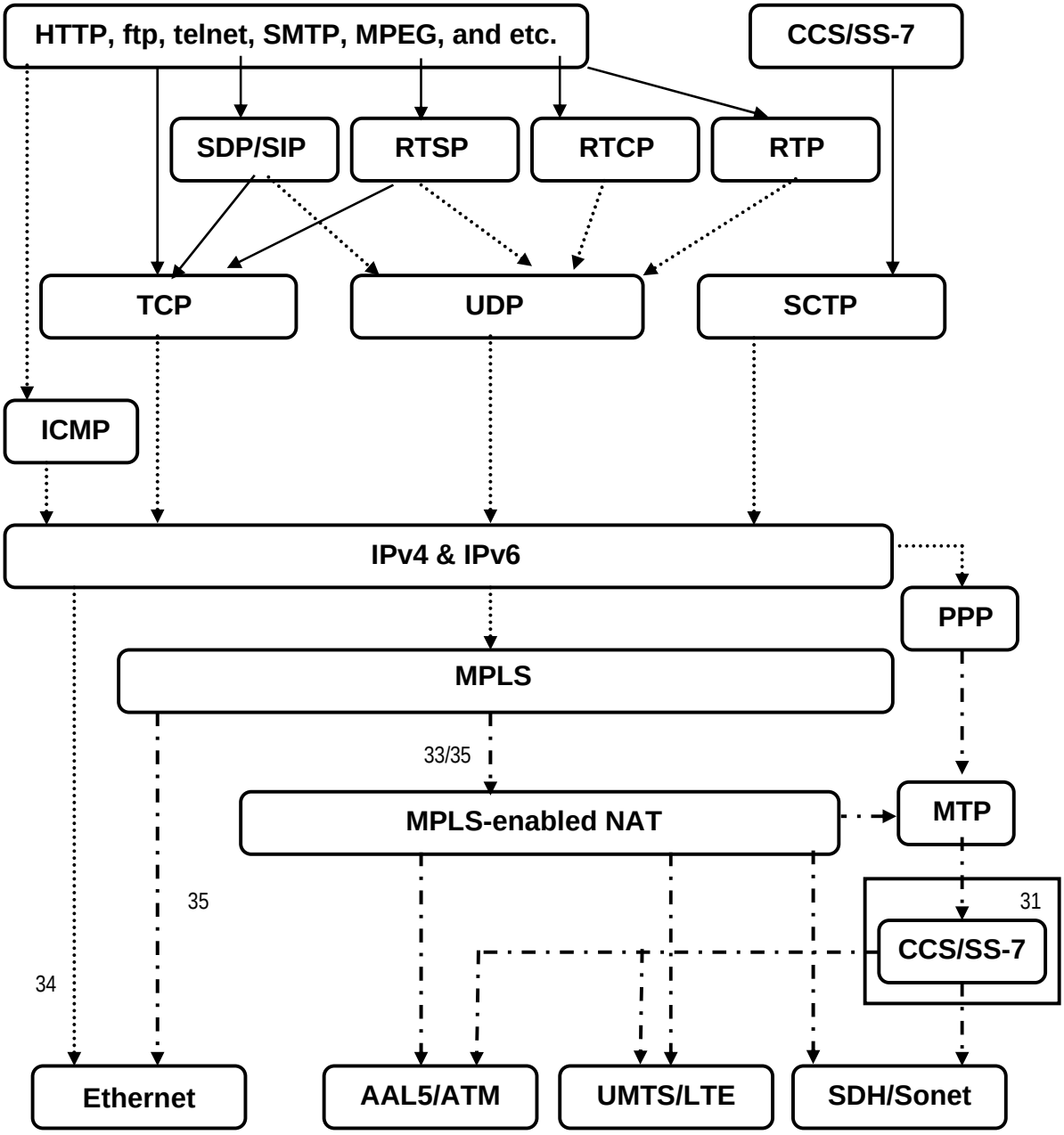

HTTP, ftp, telnet, SMTP, MPEG, and etc.
CCS/SS-7
SDP/SIP
RTSP
RTCP
RTP
TCP
UDP
SCTP
ICMP
IPv4 & IPv6
PPP
MPLS
33/35
MPLS-enabled NAT
MTP
35
31
CCS/SS-7
34
Ethernet
AAL5/ATM
UMTS/LTE
SDH/Sonet

Fig. 7

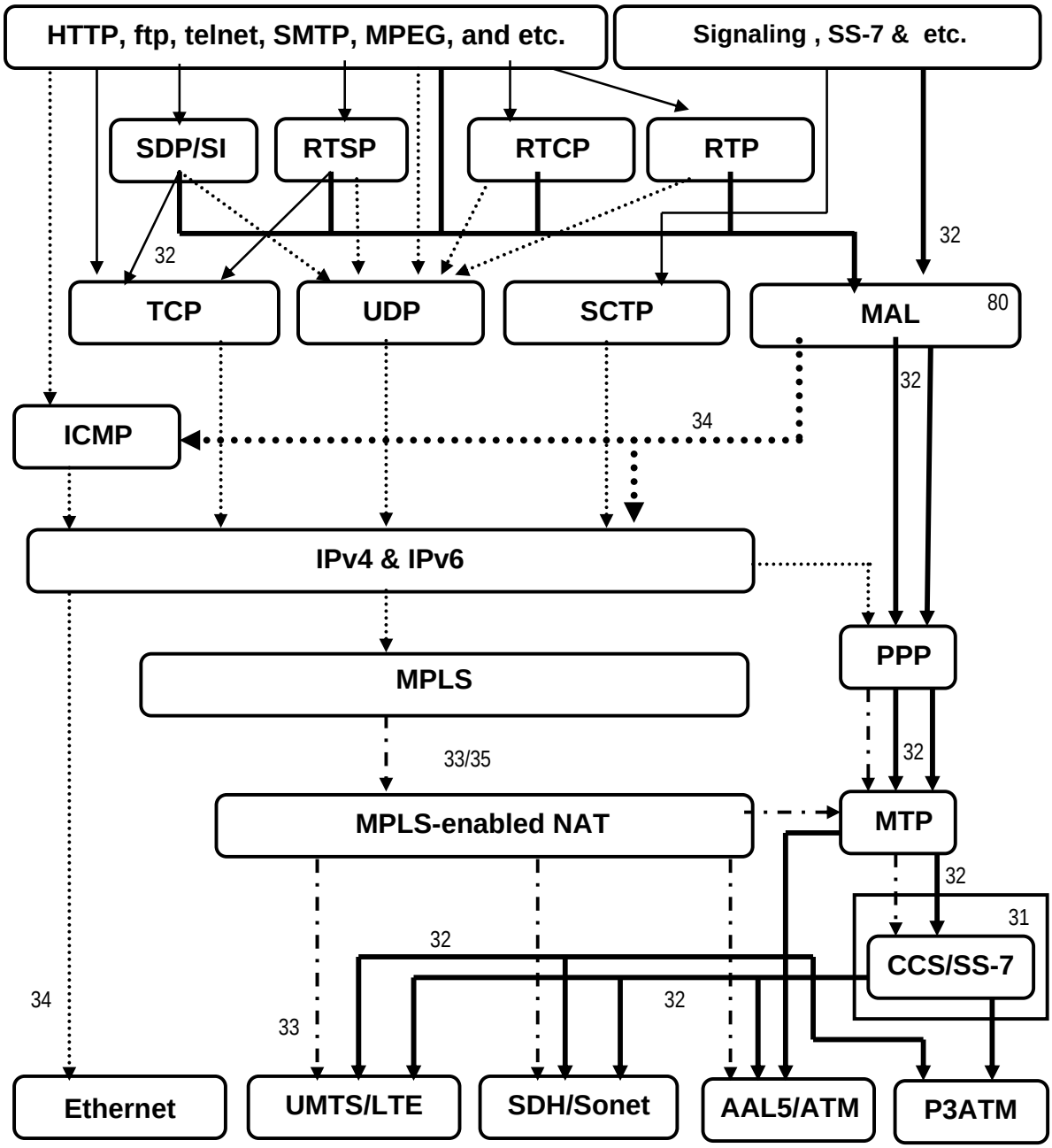

HTTP, ftp, telnet, SMTP, MPEG, and etc.
Signaling , SS-7 & etc.
SDP/SI
RTSP
RTCP
RTP
32
32
TCP
UDP
SCTP
MAL
80
32
ICMP
34
IPv4 & IPv6
PPP
MPLS
32
33/35
MPLS-enabled NAT
MTP
32
31
32
CCS/SS-7
34
32
33
Ethernet
UMTS/LTE
SDH/Sonet
AAL5/ATM
P3ATM

Fig. 8

Prior Art

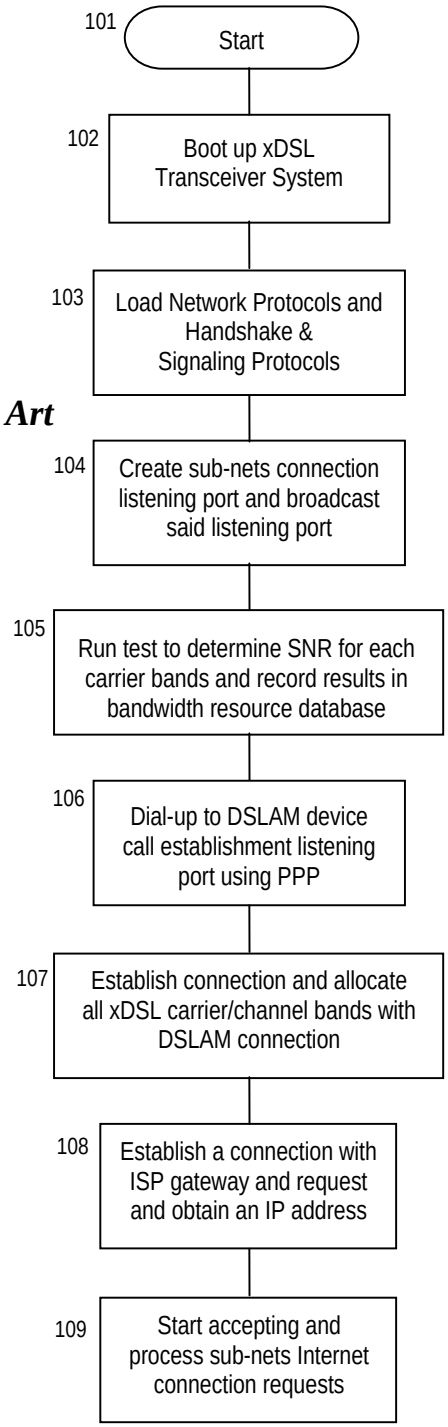


Fig. 9

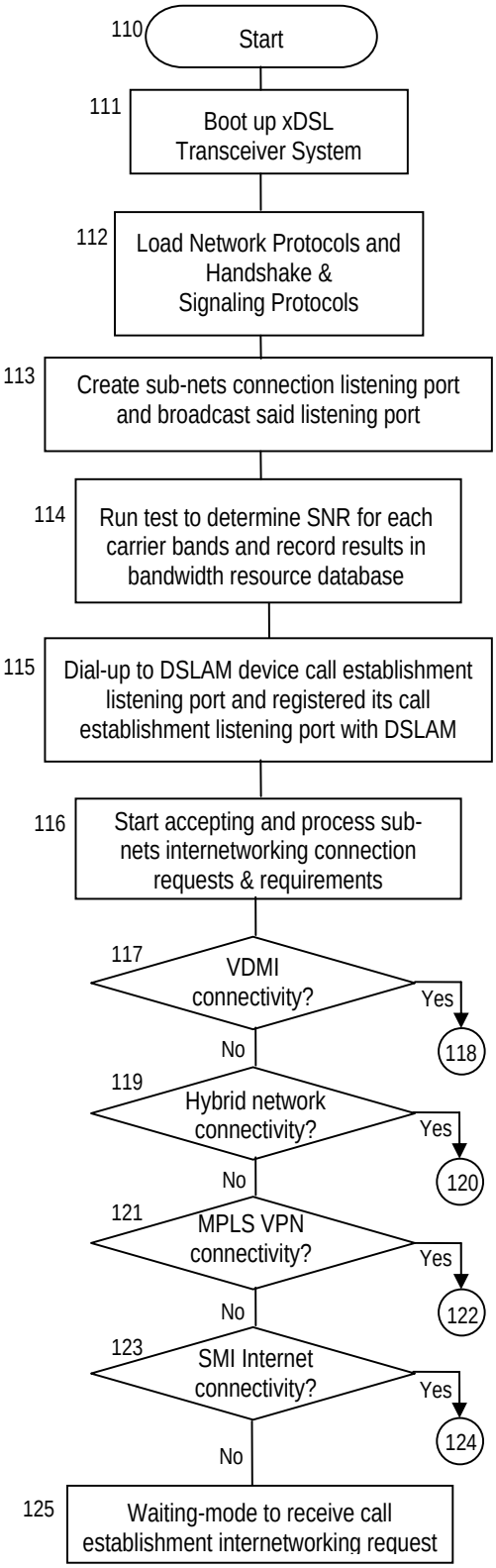


Fig. 10

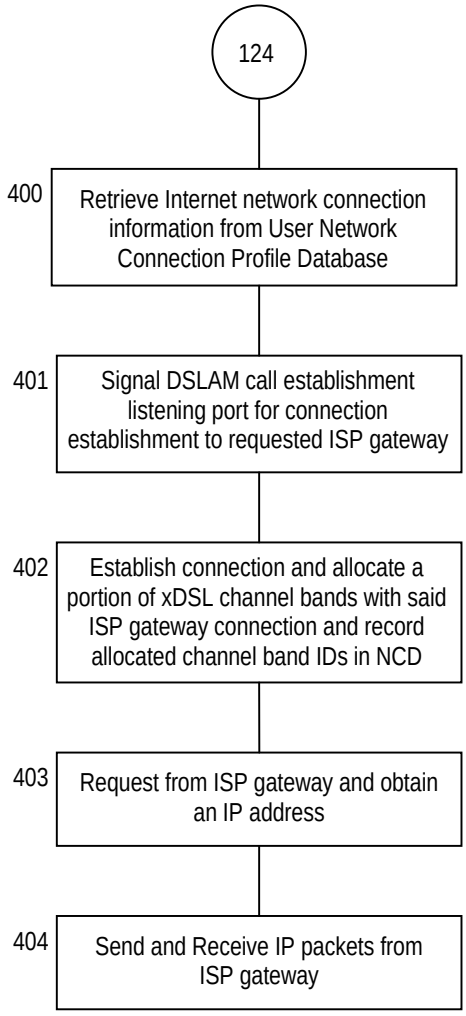

124
400
Retrieve Internet network connection information from User Network Connection Profile Database
401
Signal DSLAM call establishment listening port for connection establishment to requested ISP gateway
402
Establish connection and allocate a portion of xDSL channel bands with said ISP gateway connection and record allocated channel band IDs in NCD
403
Request from ISP gateway and obtain an IP address
404
Send and Receive IP packets from ISP gateway

Fig. 11

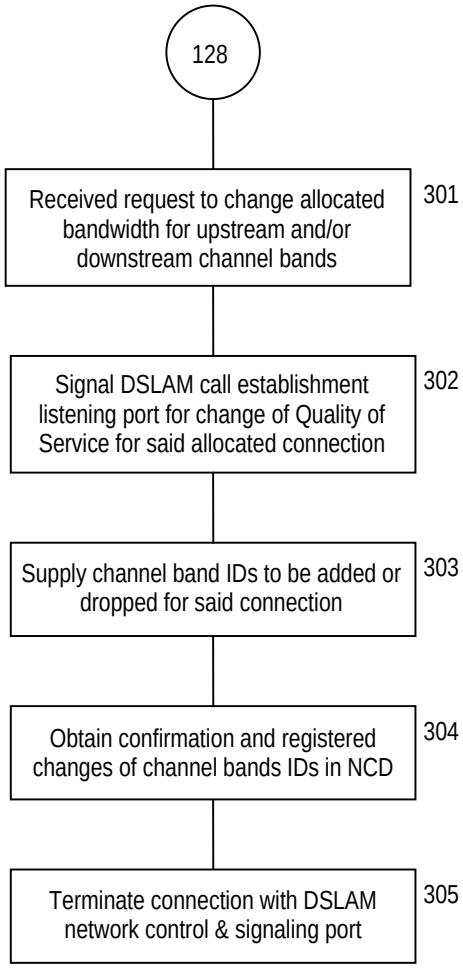

128
Received request to change allocated bandwidth for upstream and/or downstream channel bands
301
Signal DSLAM call establishment listening port for change of Quality of Service for said allocated connection
302
Supply channel band IDs to be added or dropped for said connection
303
Obtain confirmation and registered changes of channel bands IDs in NCD
304
Terminate connection with DSLAM network control & signaling port
305

Fig. 12

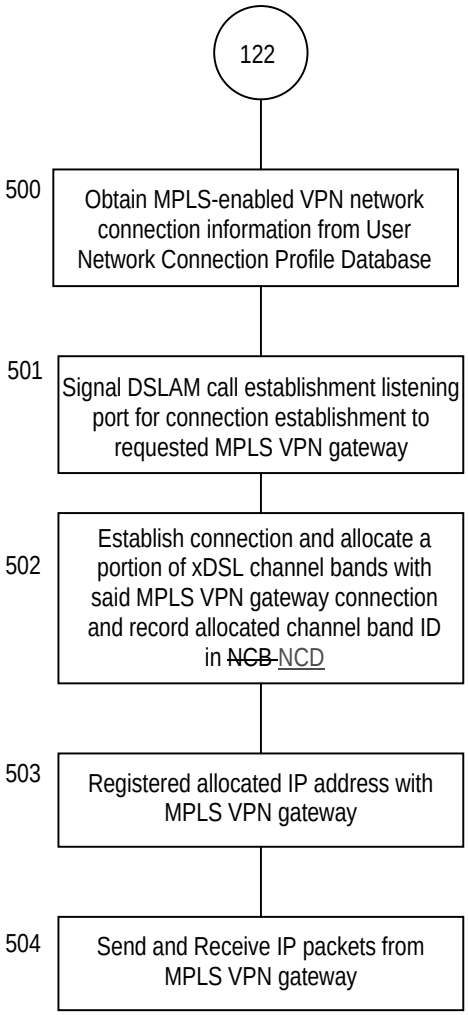

122
500
Obtain MPLS-enabled VPN network connection information from User Network Connection Profile Database
501
Signal DSLAM call establishment listening port for connection establishment to requested MPLS VPN gateway
502
Establish connection and allocate a portion of xDSL channel bands with said MPLS VPN gateway connection and record allocated channel band ID in ~~NCB~~ NCD
503
Registered allocated IP address with MPLS VPN gateway
504
Send and Receive IP packets from MPLS VPN gateway

Fig. 13

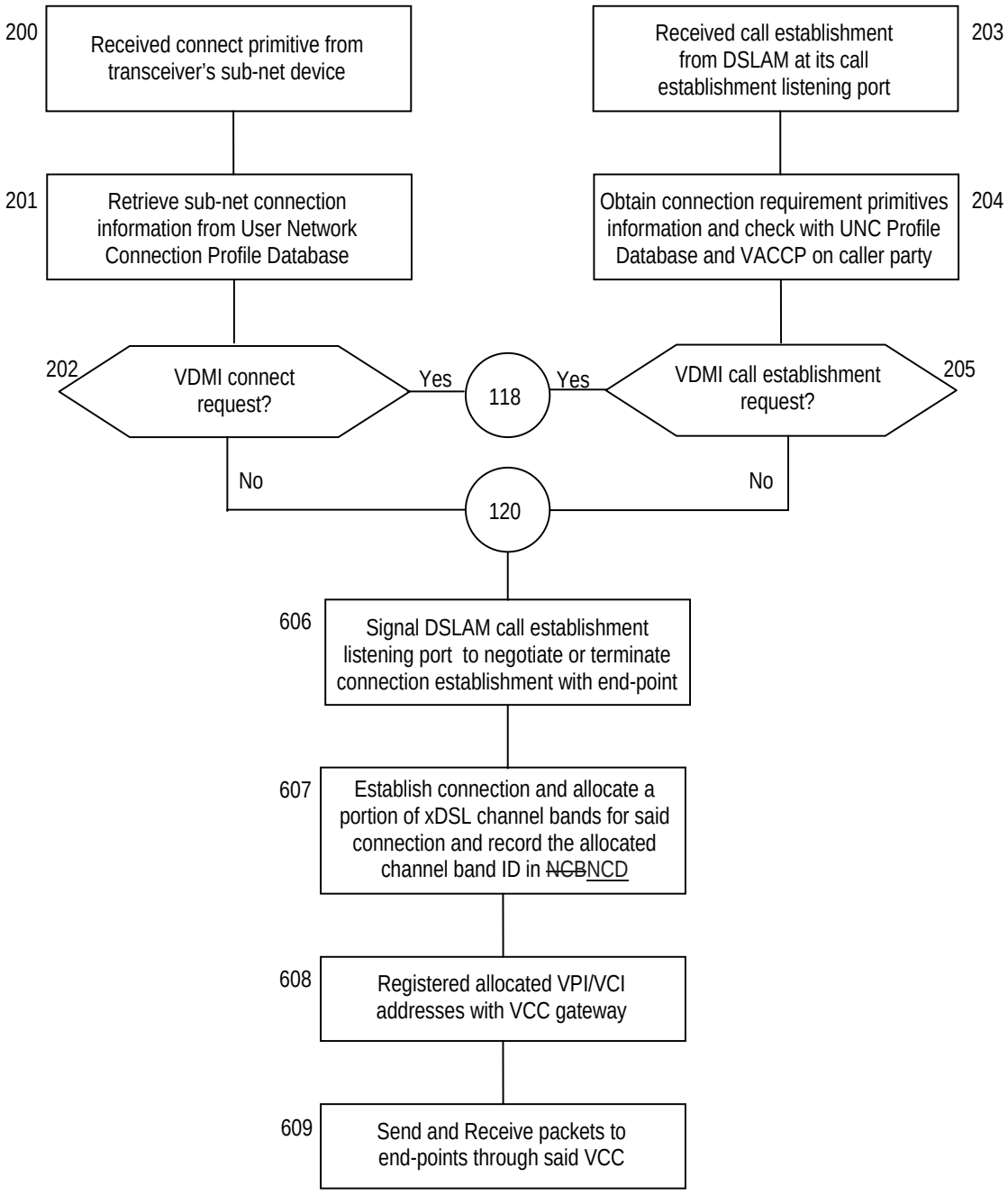

200
Received connect primitive from transceiver's sub-net device
201
Retrieve sub-net connection information from User Network Connection Profile Database
202
VDMI connect request?
Yes
118
Yes
VDMI call establishment request?
205
203
Received call establishment from DSLAM at its call establishment listening port
204
Obtain connection requirement primitives information and check with UNC Profile Database and VACCP on caller party
No
120
No
606
Signal DSLAM call establishment listening port to negotiate or terminate connection establishment with end-point
607
Establish connection and allocate a portion of xDSL channel bands for said connection and record the allocated channel band ID in ~~NCB~~NCD
608
Registered allocated VPI/VCI addresses with VCC gateway
609
Send and Receive packets to end-points through said VCC

Fig. 14

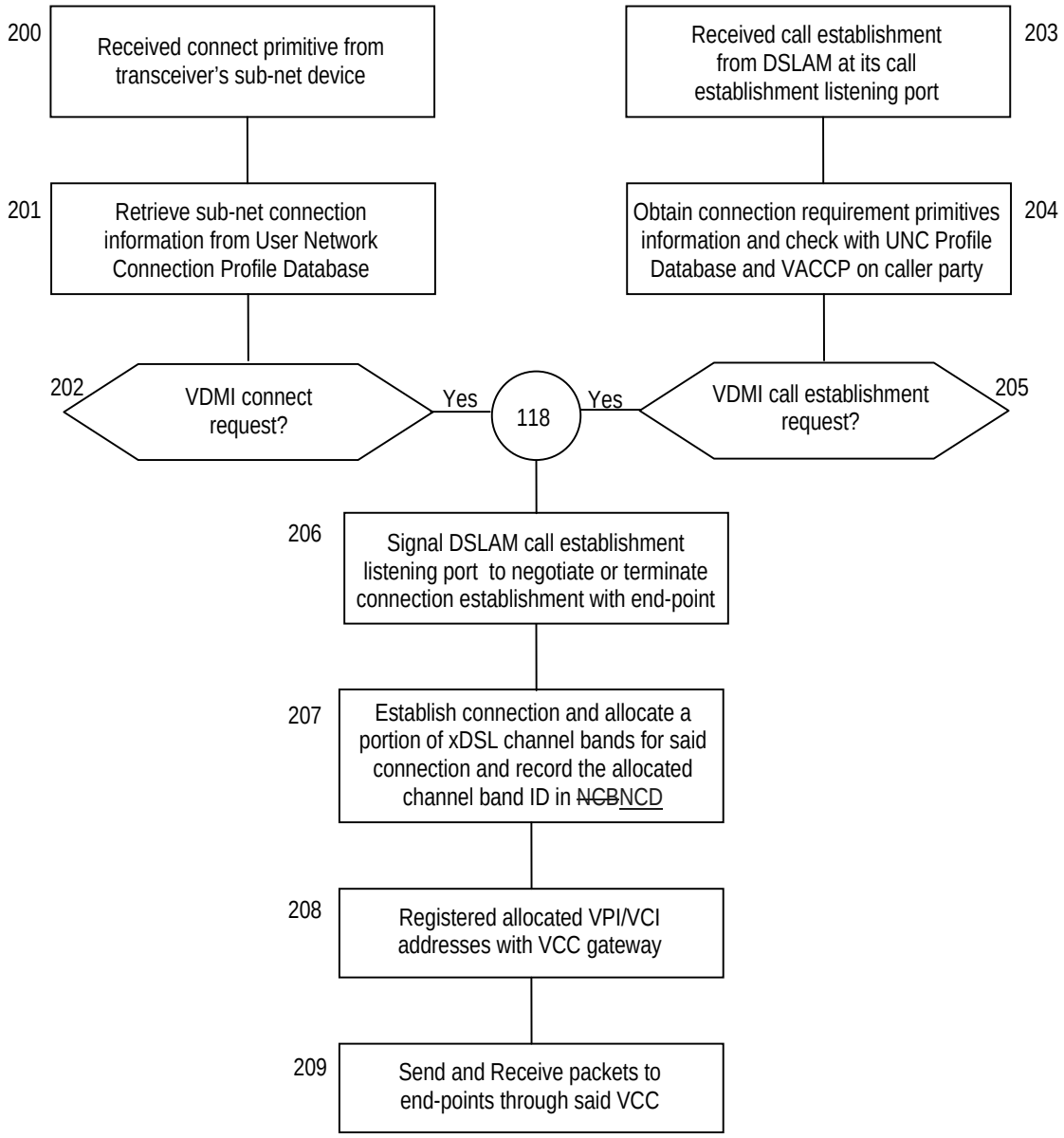

200
Received connect primitive from transceiver's sub-net device
201
Retrieve sub-net connection information from User Network Connection Profile Database
202
VDMI connect request?
Yes
118
Yes
VDMI call establishment request?
205
203
Received call establishment from DSLAM at its call establishment listening port
204
Obtain connection requirement primitives information and check with UNC Profile Database and VACCP on caller party
206
Signal DSLAM call establishment listening port to negotiate or terminate connection establishment with end-point
207
Establish connection and allocate a portion of xDSL channel bands for said connection and record the allocated channel band ID in ~~NCB~~NCD
208
Registered allocated VPI/VCI addresses with VCC gateway
209
Send and Receive packets to end-points through said VCC

Fig. 15