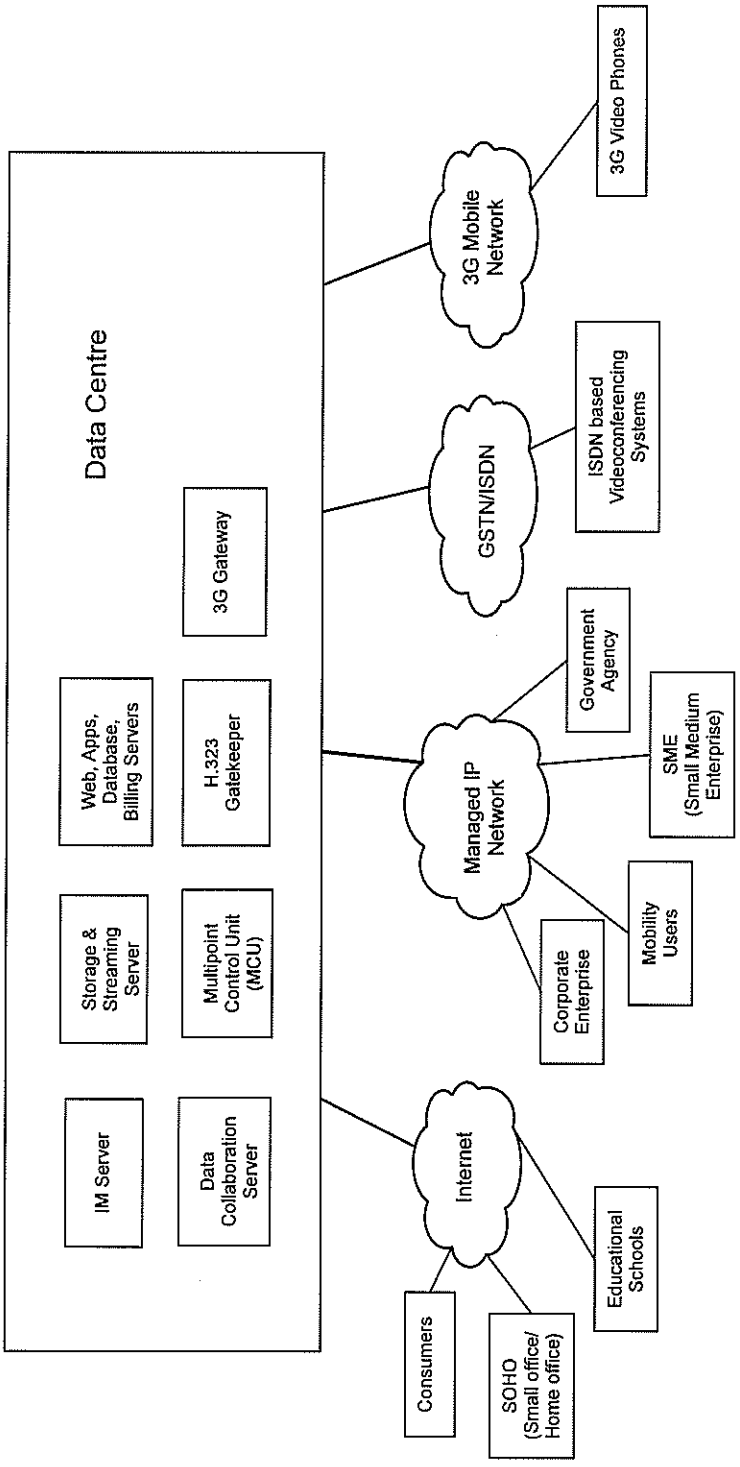

Data Centre
IM Server
Data Collaboration Server
Storage & Streaming Server
Multipoint Control Unit (MCU)
Web, Apps, Database, Billing Servers
H.323 Gatekeeper
3G Gateway
Internet
Consumers
SOHO (Small office/ Home office)
Educational Schools
Managed IP Network
Corporate Enterprise
Mobility Users
Government Agency
SME (Small Medium Enterprise)
GSTN/ISDN
ISDN based Videoconferencing Systems
3G Mobile Network
3G Video Phones

Fig 1

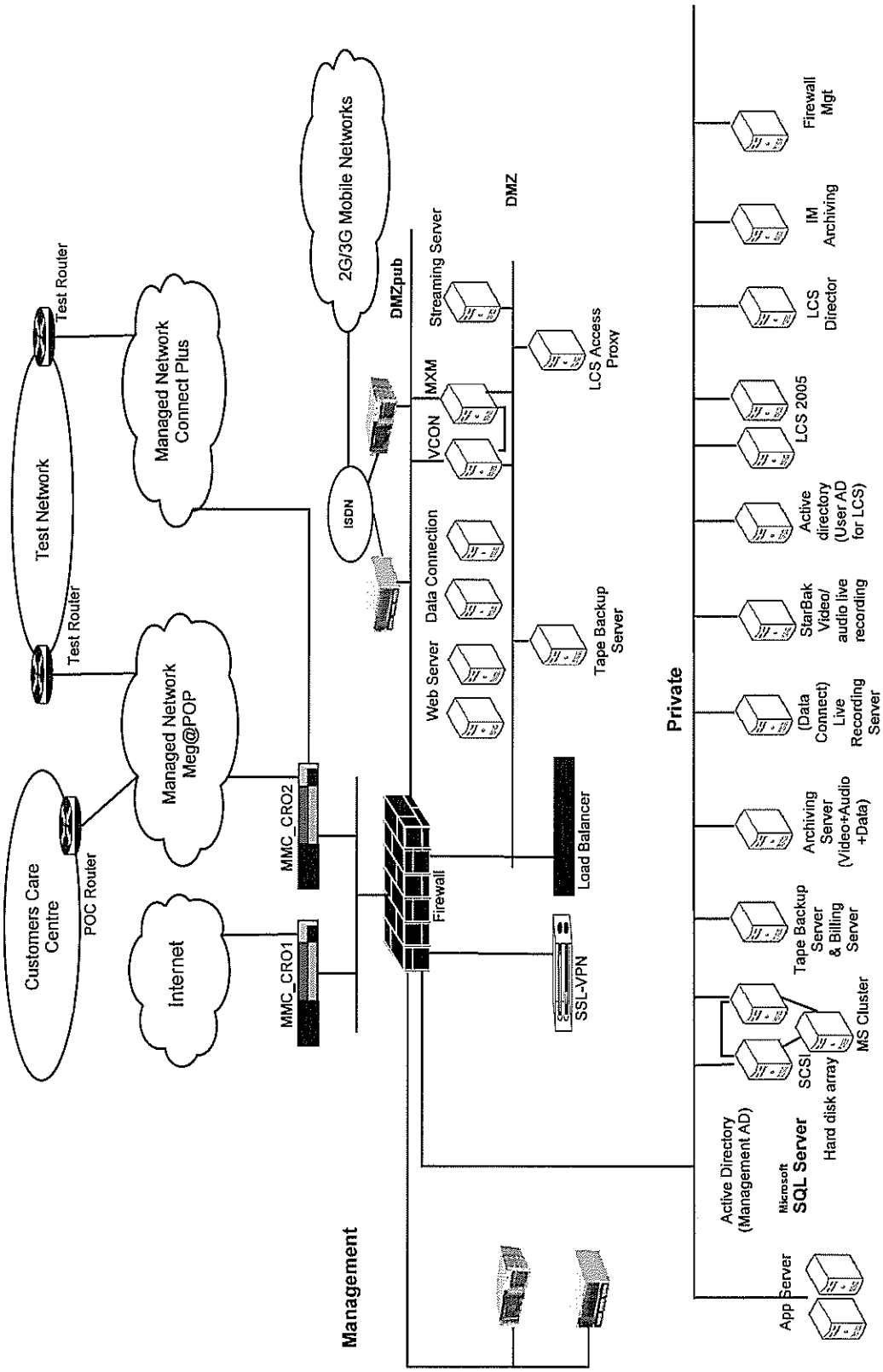

Customers Care Centre
POC Router
Internet
Managed Network Meg@POP
Test Network
Test Router
Test Router
Managed Network Connect Plus
2G/3G Mobile Networks
ISDN
MMC_CRO1
MMC_CRO2
Firewall
SSL-VPN
Load Balancer
DMZpub
Web Server
Data Connection
VCON
MXM
Streaming Server
LCS Access Proxy
Tape Backup Server
DMZ
Management
Private
Active Directory (Management AD)
App Server
Microsoft SQL Server
SCSI Hard disk array
MS Cluster
Tape Backup Server & Billing Server
Archiving Server (Video+Audio +Data)
(Data Connect) Live Recording Server
StarBak Video/ audio live recording
Active directory (User AD for LCS)
LCS 2005
LCS Director
IM Archiving
Firewall Mgt

Fig 2

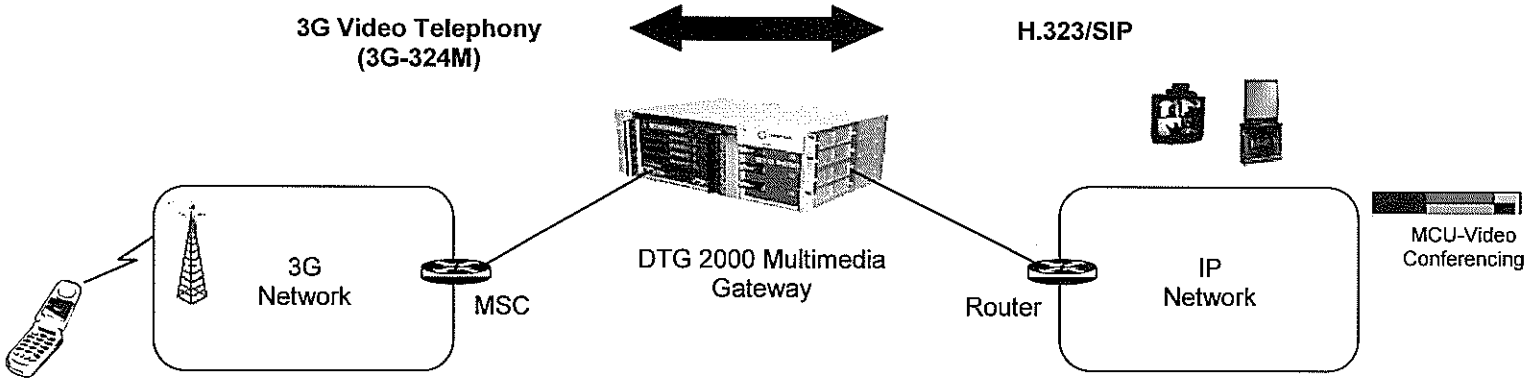

3G Video Telephony
(3G-324M)
H.323/SIP
3G
Network
MSC
DTG 2000 Multimedia
Gateway
Router
IP
Network
MCU-Video
Conferencing

Fig 3

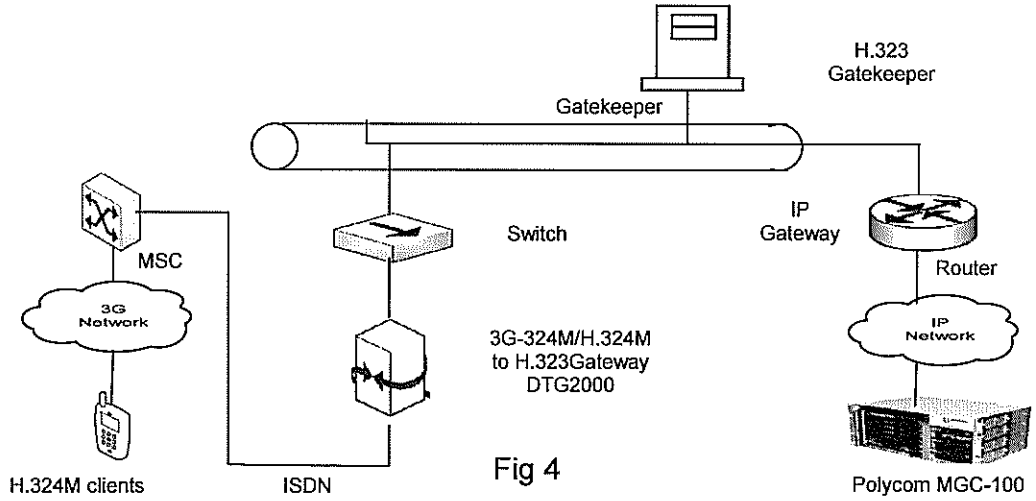

H.323
Gatekeeper
Gatekeeper
Switch
IP
Gateway
Router
MSC
3G
Network
IP
Network
3G-324M/H.324M
to H.323Gateway
DTG2000
H.324M clients
ISDN
Polycom MGC-100

Fig 4

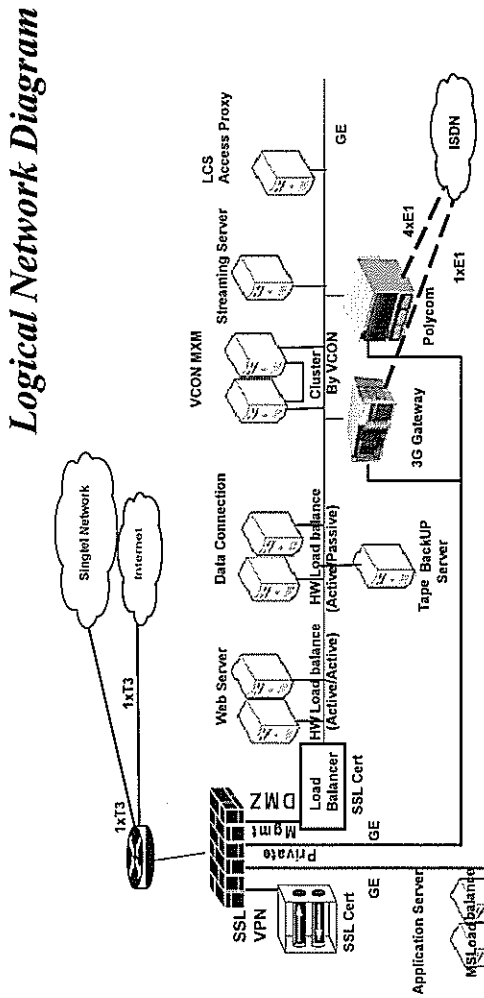

Logical Network Diagram
Singtel Network
Internet
1xT3
1xT3
SSL VPN
SSL Cert
GE
DMZ
Mgmt
Private
Load Balancer
SSL Cert
GE
Application Server
MS Load balance (Active/Active)
Web Server
HW Load balance (Active/Active)
Data Connection
HW Load balance (Active/Passive)
Tape BackUP Server
VCON MXM
Streaming Server
LCS Access Proxy
Cluster
By VCON
GE
3G Gateway
4xE1
1xE1
Polycom
ISDN
IM
Archiving
LCS Director
LCS 2005
Active Directory (user AD for LCS)
StarBak Video/audio live Recording
(Data Connect) Live Recording Server
Archiving Server (Video+ Audio+Data
Tape backup Server & Billing Server
MS Cluster
(Active/Passive)
SCSI
Microsoft SQL Server
Active Directory (Management AD)
Hard disk Array
Fire Admin Server

Fig 5

Physical Network Diagram

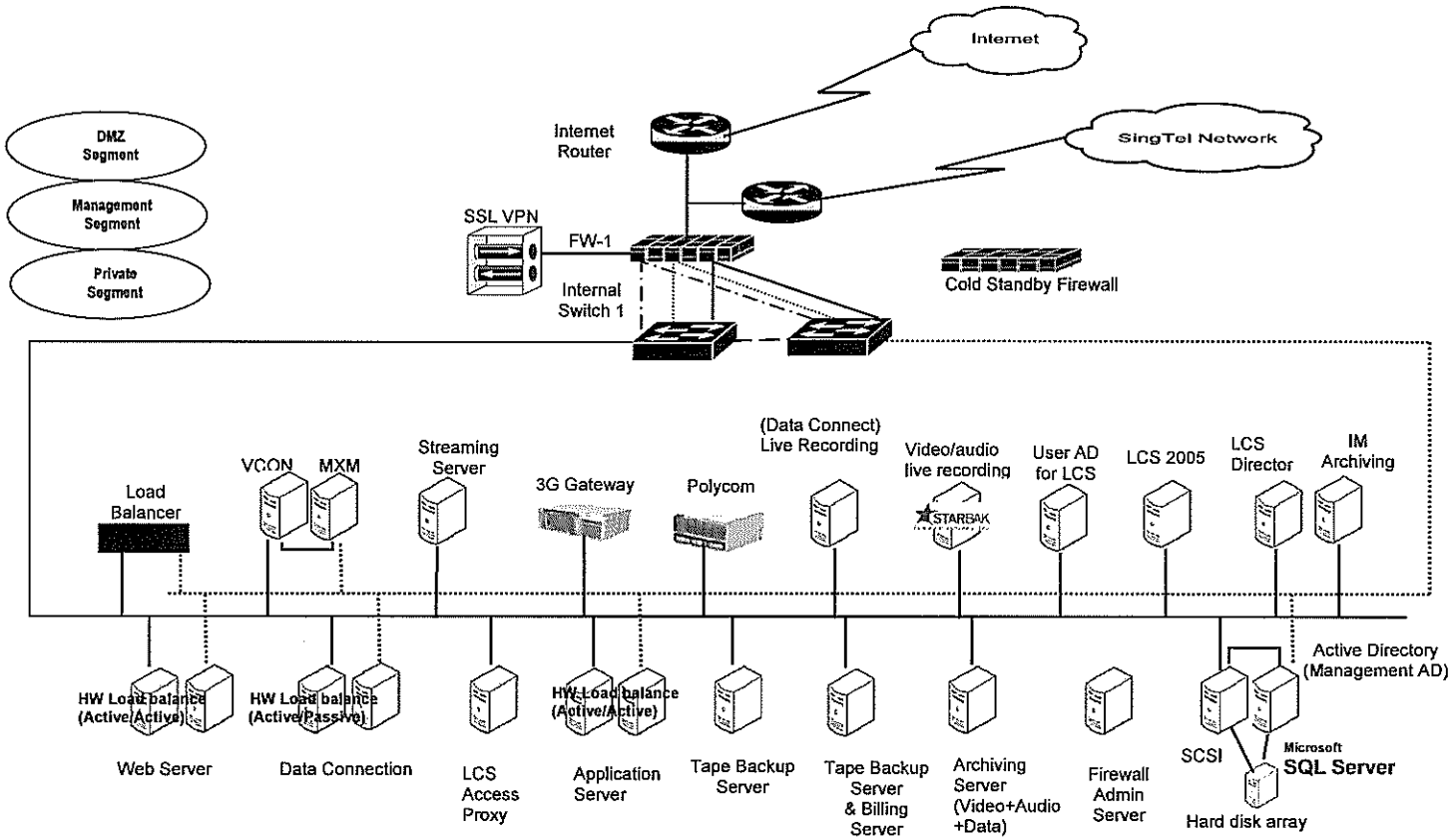


Fig 6

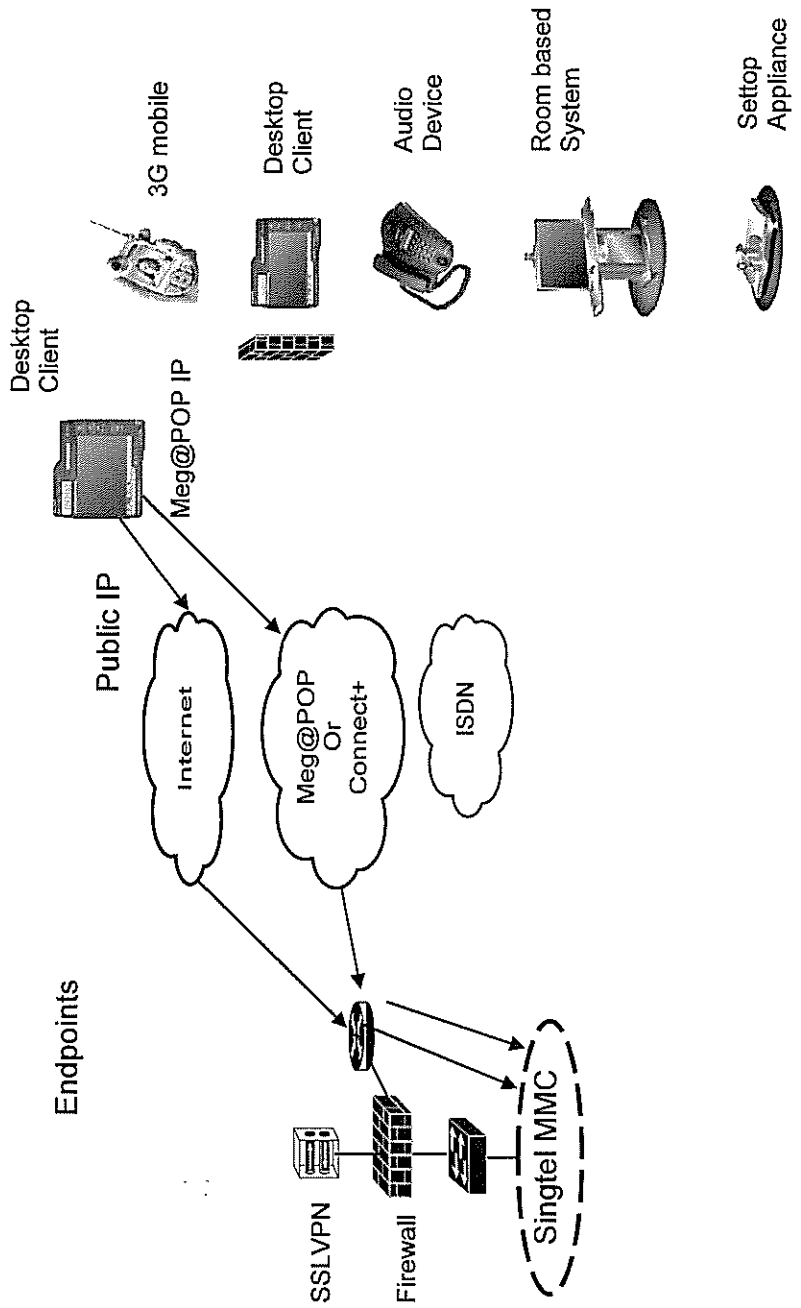

Endpoints
Desktop Client
Public IP
Meg@POP IP
3G mobile
Desktop Client
Audio Device
Room based System
Settop Appliance
Internet
Meg@POP Or Connect+
ISDN
SSLVPN
Firewall
Singtel MMC

Fig 7

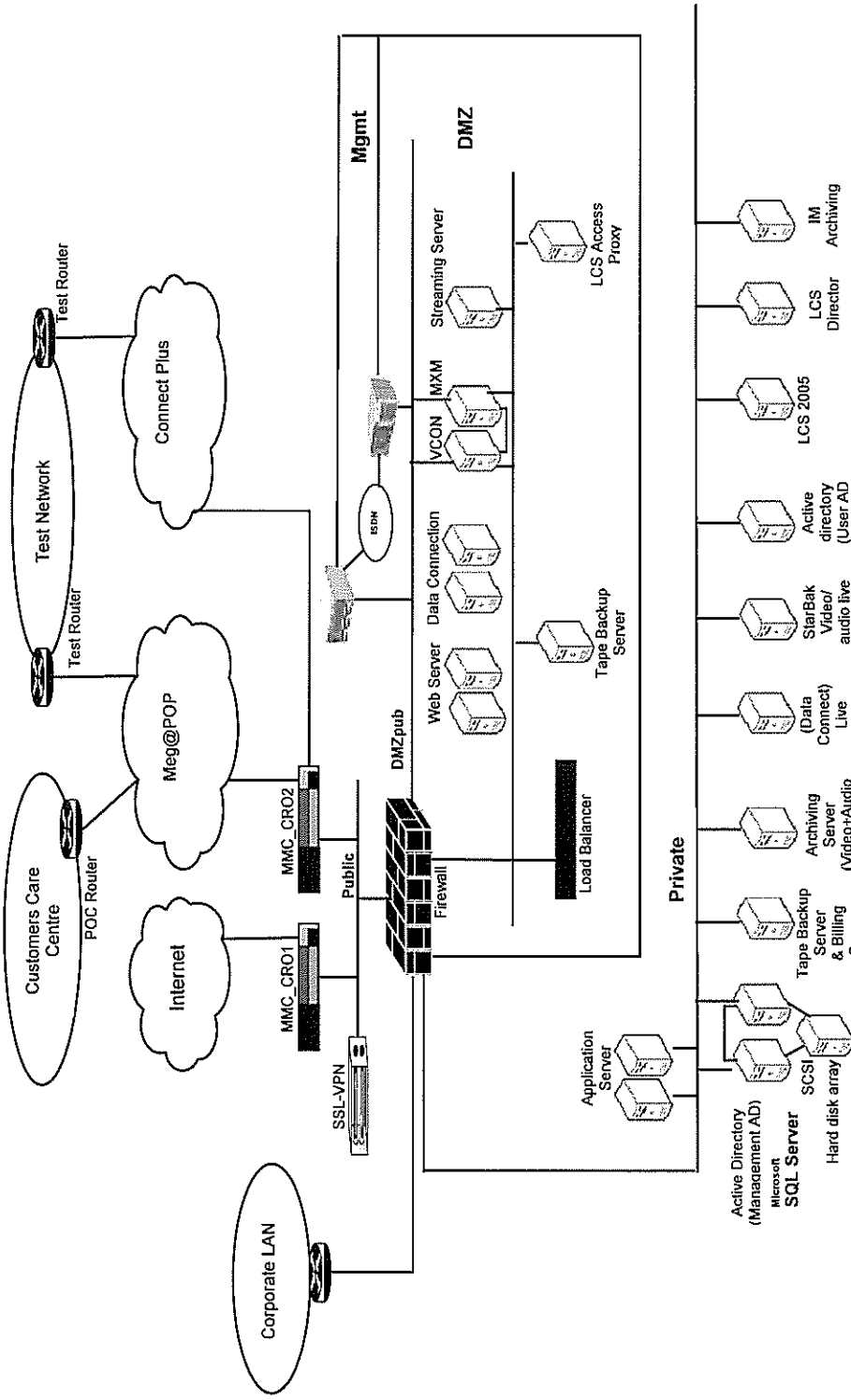

Test Router
Test Network
Test Router
Connect Plus
Customers Care Centre
POC Router
Meg@POP
Internet
MMC_CRO2
MMC_CRO1
Public
SSL-VPN
Corporate LAN
DMZpub
Firewall
Mgmt
ISDN
DMZ
Streaming Server
LCS Access Proxy
MXM
VCON
Data Connection
Web Server
Tape Backup Server
Load Balancer
Private
Application Server
Active Directory (Management AD)
Microsoft SQL Server
SCSI
Hard disk array
MS Cluster
Tape Backup Server & Billing Server
Archiving Server (Video+Audio +Data)
(Data Connect) Live Recording Server
StarBak Video/ audio live recording
Active directory (User AD for LCS)
LCS 2005
LCS Director
IM Archiving

Fig 8

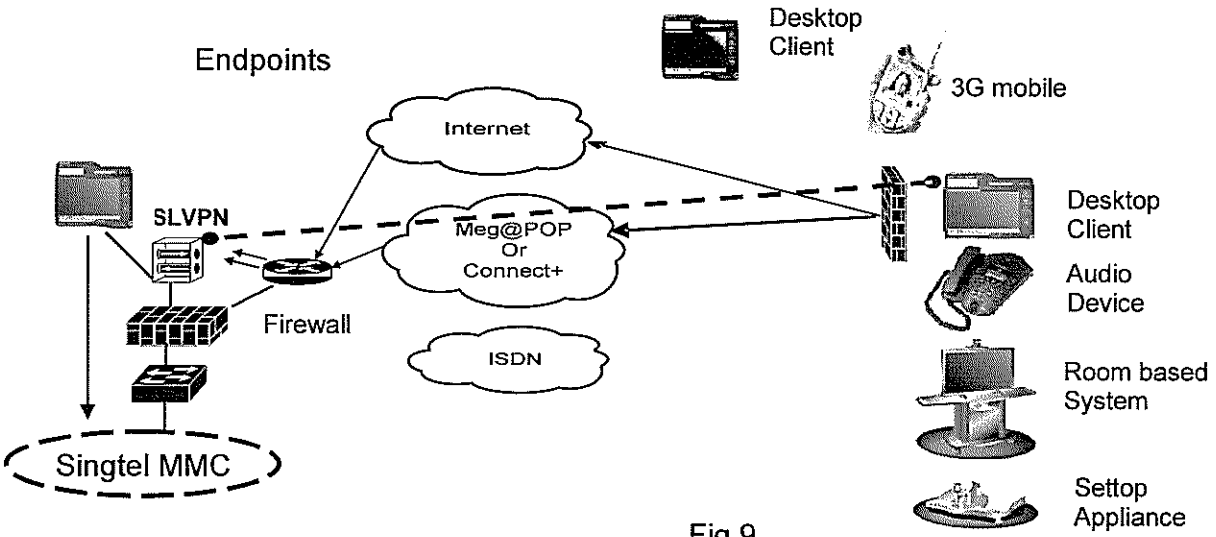

Endpoints
Desktop Client
3G mobile
Internet
SLVPN
Meg@POP Or Connect+
Desktop Client
Audio Device
Firewall
ISDN
Room based System
Singtel MMC
Settop Appliance

Fig 9

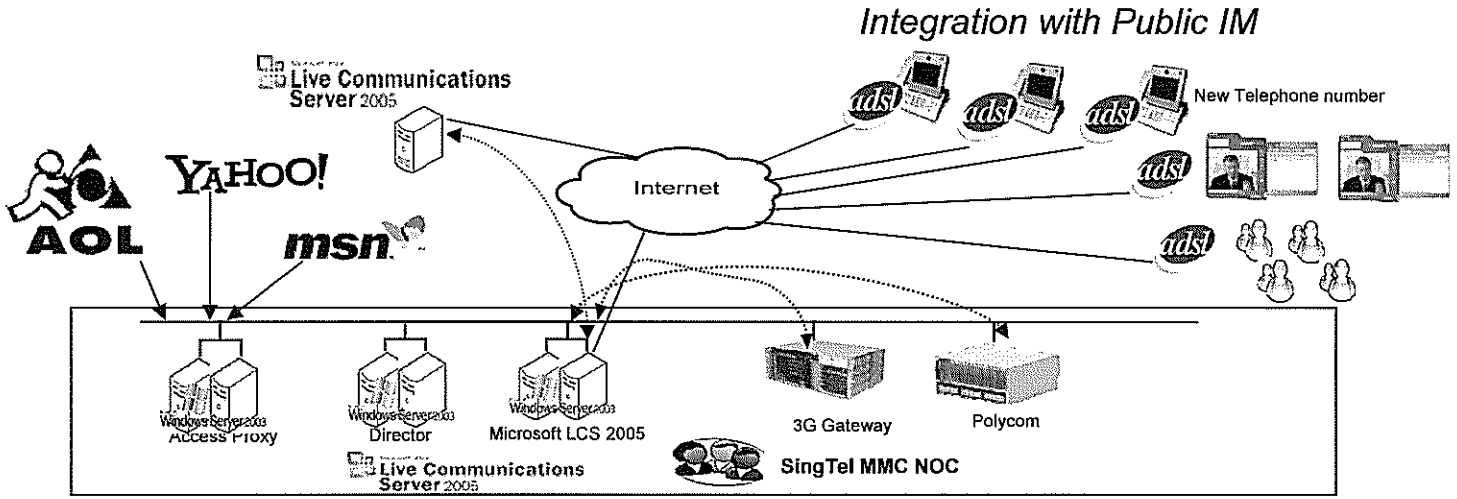

Integration with Public IM
Live Communications Server 2005
New Telephone number
YAHOO!
AOL
msn
Internet
Director
Microsoft LCS 2005
3G Gateway
Polycom
Live Communications Server 2005
SingTel MMC NOC

Fig 10

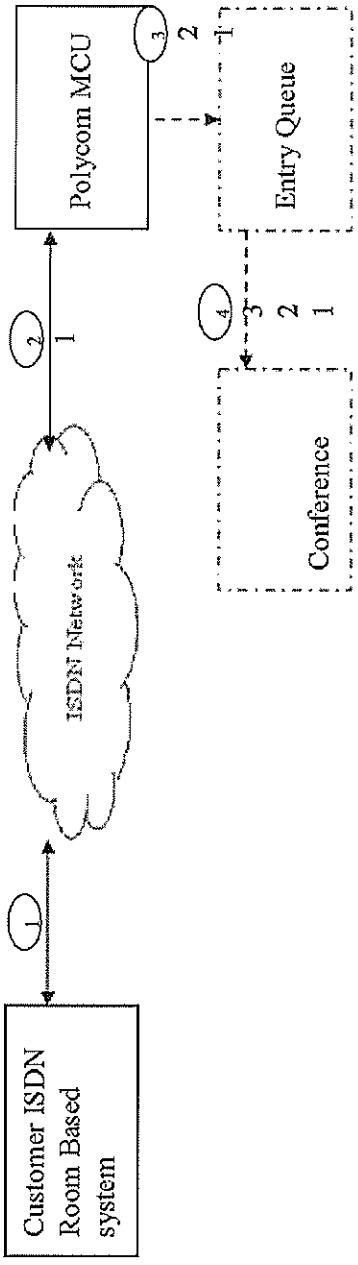

Customer ISDN Room Based system
ISDN Network
Polycom MCU
Entry Queue
Conference
1
2
3
4

Fig 11

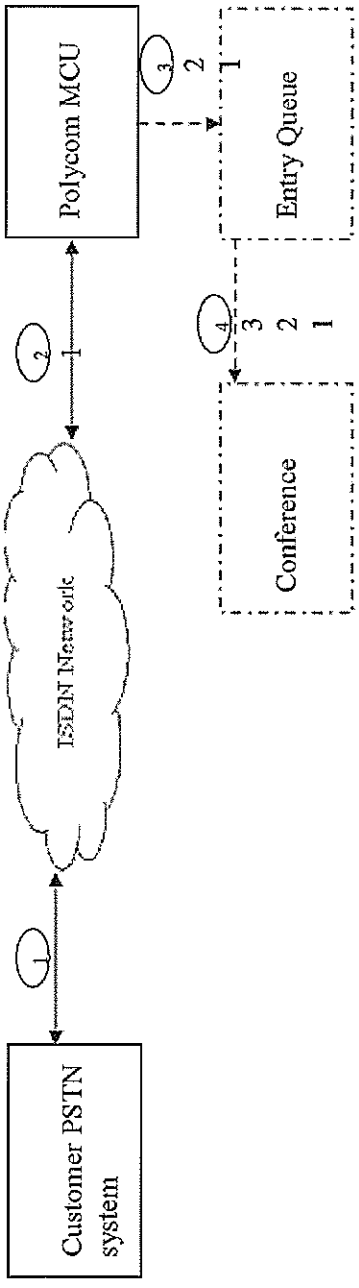

Customer PSTN system
ISDN Network
Polycom MCU
Entry Queue
Conference
1
2
3
4

Fig 12

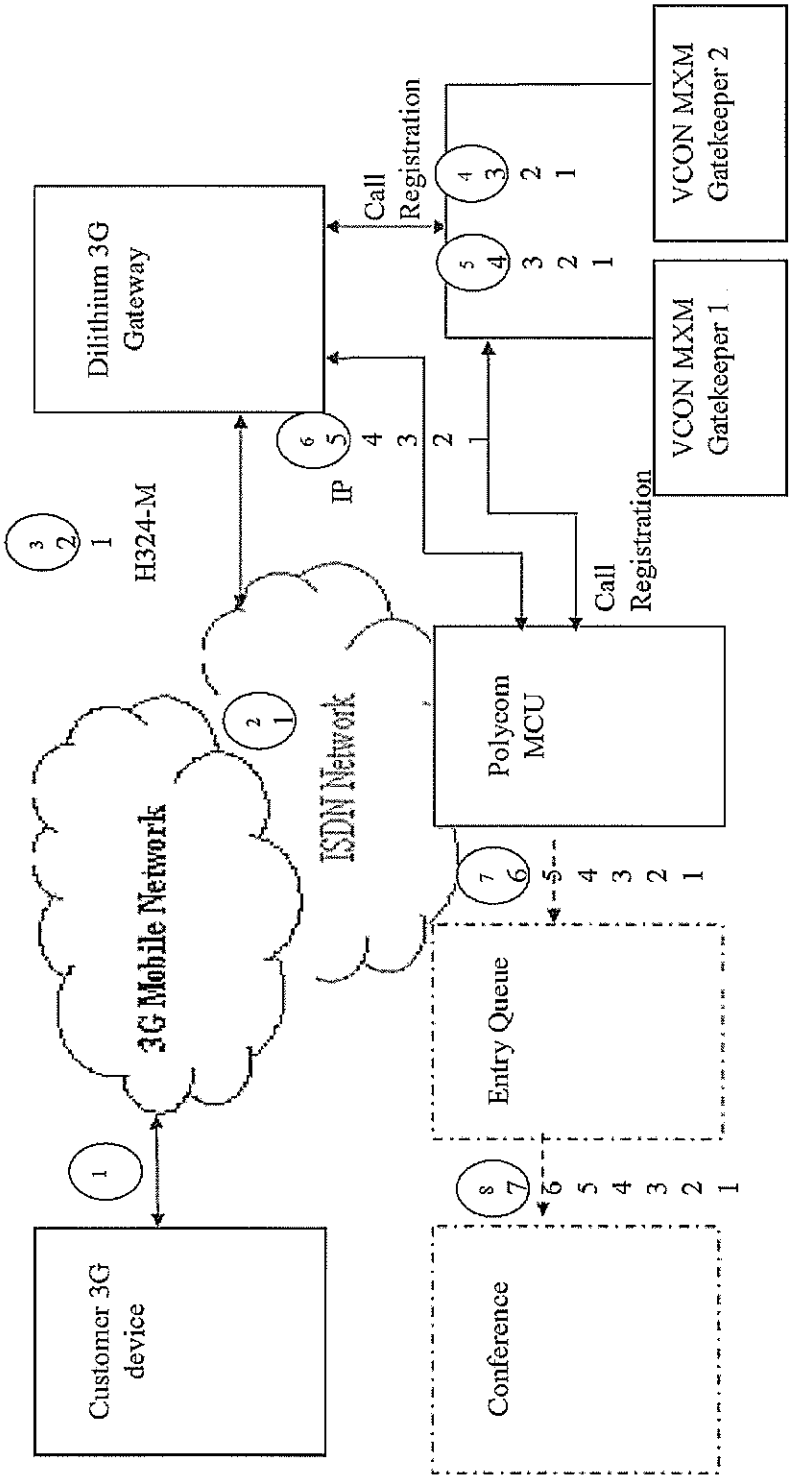

Customer 3G device
3G Mobile Network
ISDN Network
Dilithium 3G Gateway
H324-M
IP
Call Registration
Call Registration
Polycom MCU
VCON MXM Gatekeeper 1
VCON MXM Gatekeeper 2
Entry Queue
Conference

Fig 13

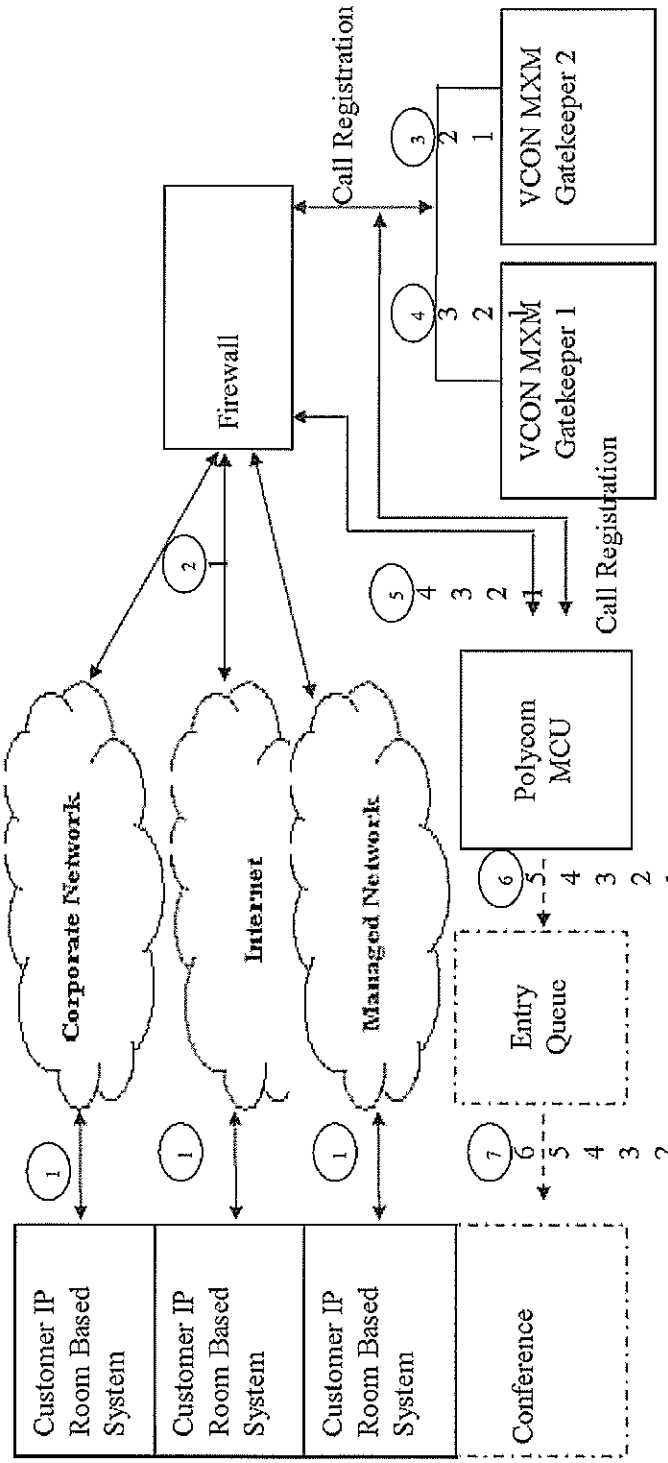

Customer IP Room Based System
Customer IP Room Based System
Customer IP Room Based System
Conference
Corporate Network
Internet
Managed Network
Firewall
Call Registration
VCON MXM Gatekeeper 2
VCON MXM Gatekeeper 1
Call Registration
Polycom MCU
Entry Queue

Fig 14

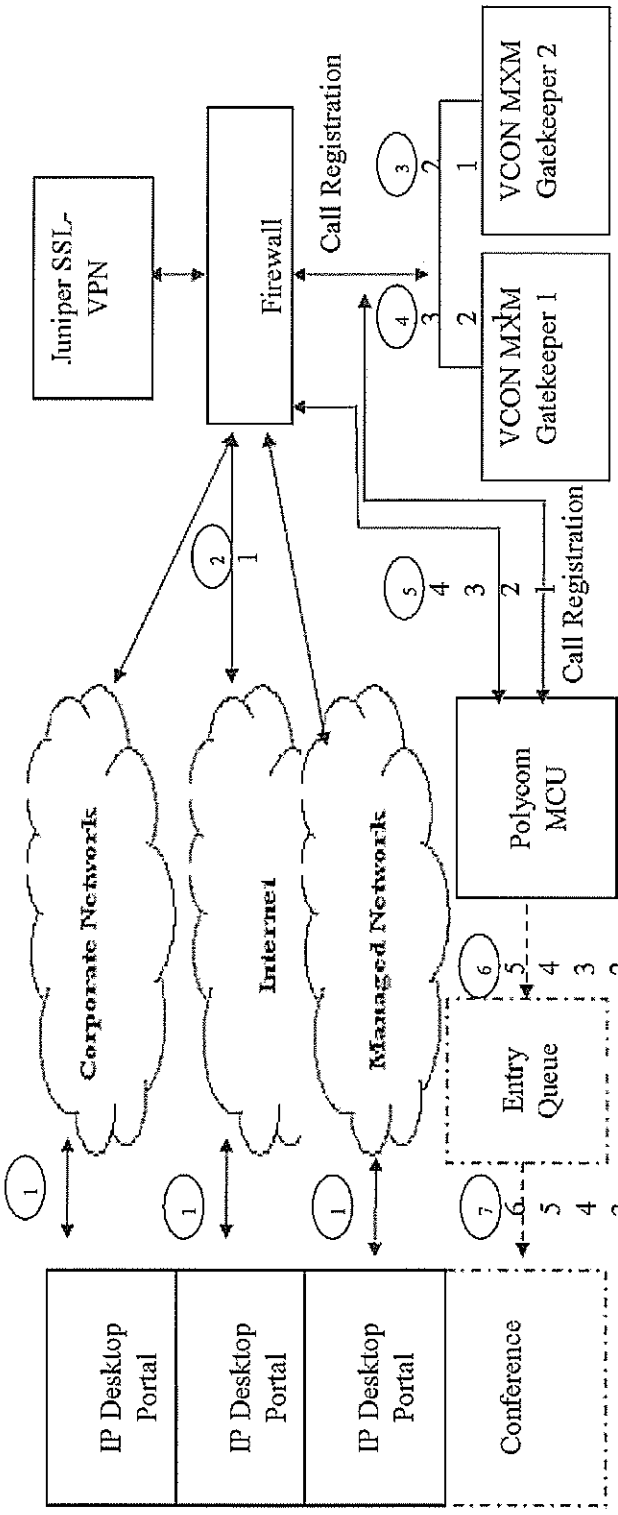

IP Desktop Portal
IP Desktop Portal
IP Desktop Portal
Conference
Corporate Network
Internet
Managed Network
Entry Queue
Polycom MCU
Call Registration
Juniper SSL-VPN
Firewall
Call Registration
VCON MXM Gatekeeper 1
VCON MXM Gatekeeper 2

Fig 15

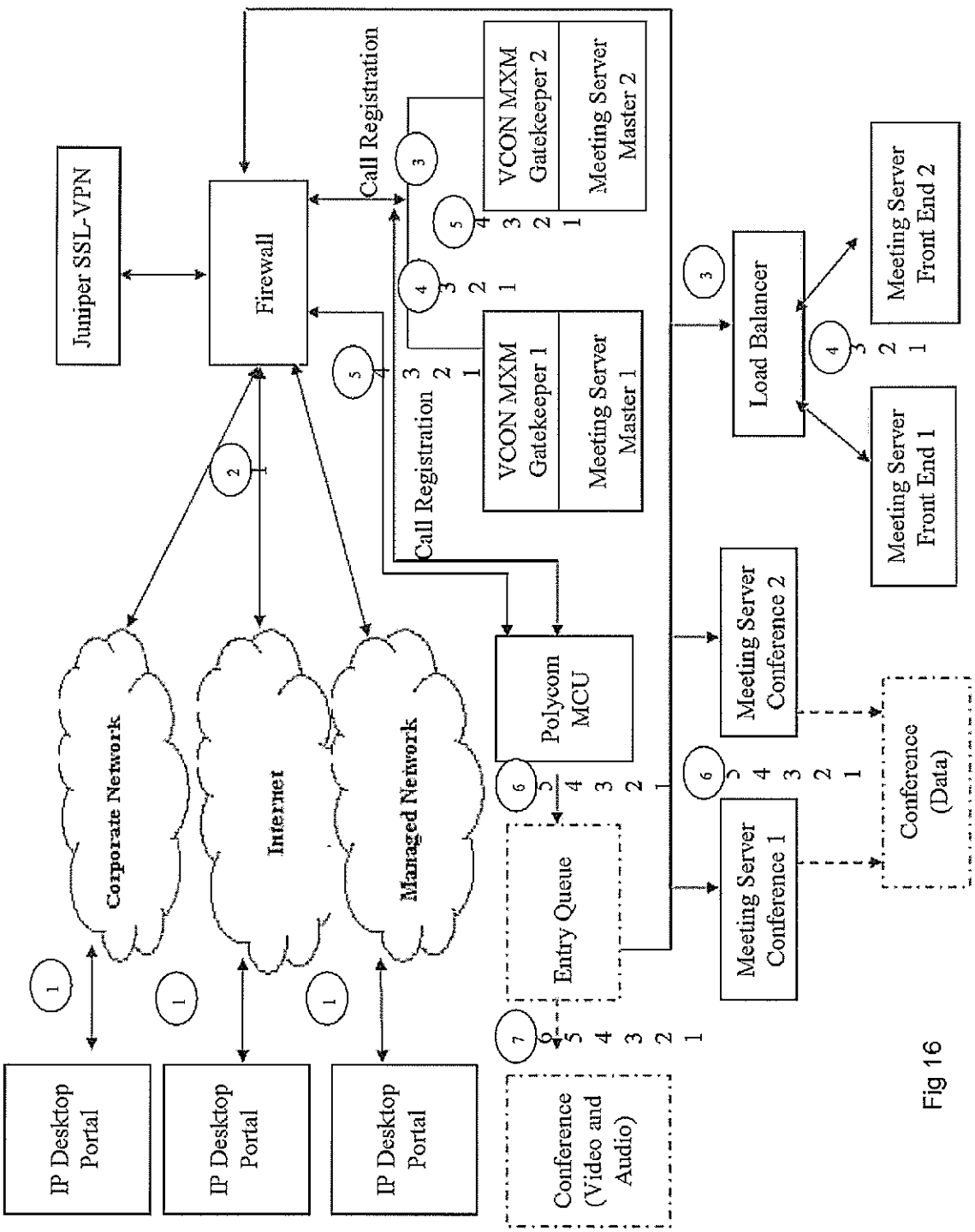

IP Desktop Portal
IP Desktop Portal
IP Desktop Portal
Conference (Video and Audio)
Corporate Network
Internet
Managed Network
Juniper SSL-VPN
Firewall
Call Registration
Call Registration
VCON MXM Gatekeeper 1
Meeting Server Master 1
VCON MXM Gatekeeper 2
Meeting Server Master 2
Polycom MCU
Entry Queue
Meeting Server Conference 1
Meeting Server Conference 2
Load Balancer
Meeting Server Front End 1
Meeting Server Front End 2
Conference (Data)

Fig 16

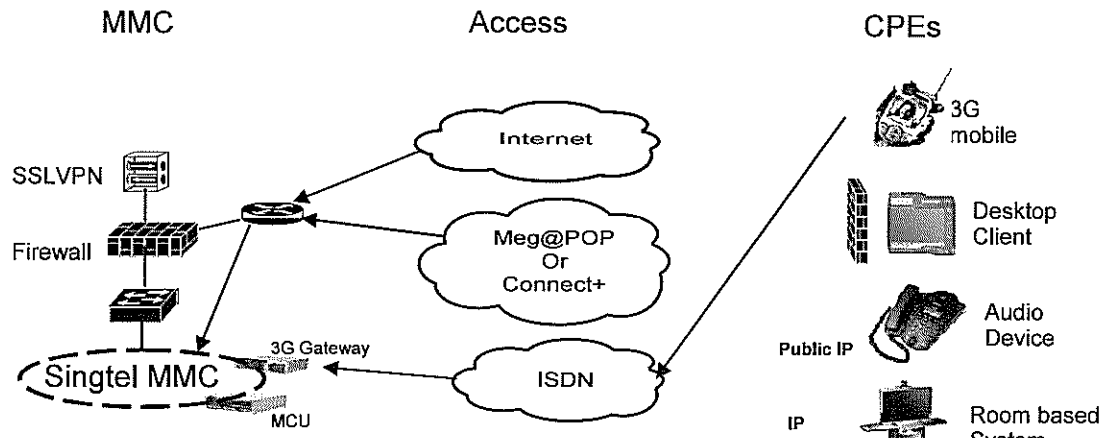

MMC
Access
CPEs
Internet
SSLVPN
Firewall
Meg@POP
Or
Connect+
3G Gateway
Singtel MMC
MCU
ISDN
3G
mobile
Desktop
Client
Audio
Device
Public IP
IP
ISDN
Room based
System

Fig 17

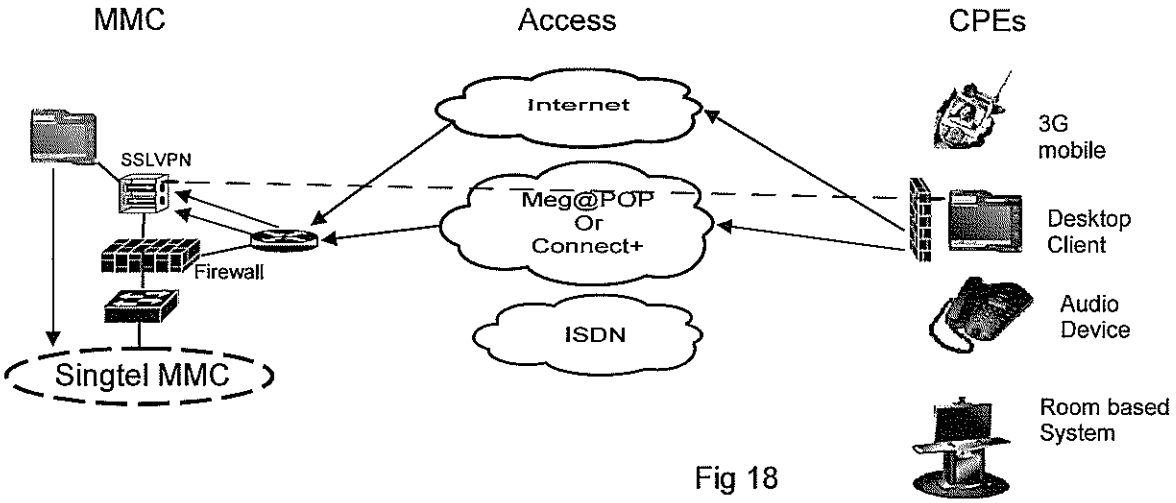

MMC
Access
CPEs
Internet
SSLVPN
Meg@POP
Or
Connect+
Firewall
ISDN
Singtel MMC
3G
mobile
Desktop
Client
Audio
Device
Room based
System

Fig 18

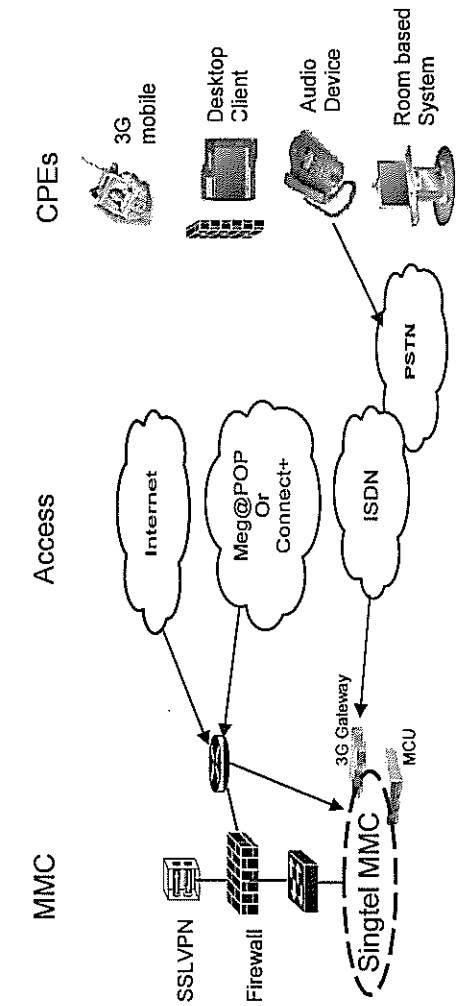

MMC
Access
CPEs
3G mobile
Desktop Client
Audio Device
Room based System
Internet
Meg@POP Or Connect+
ISDN
PSTN
SSLVPN
Firewall
3G Gateway
MCU
Singtel MMC

Fig 19

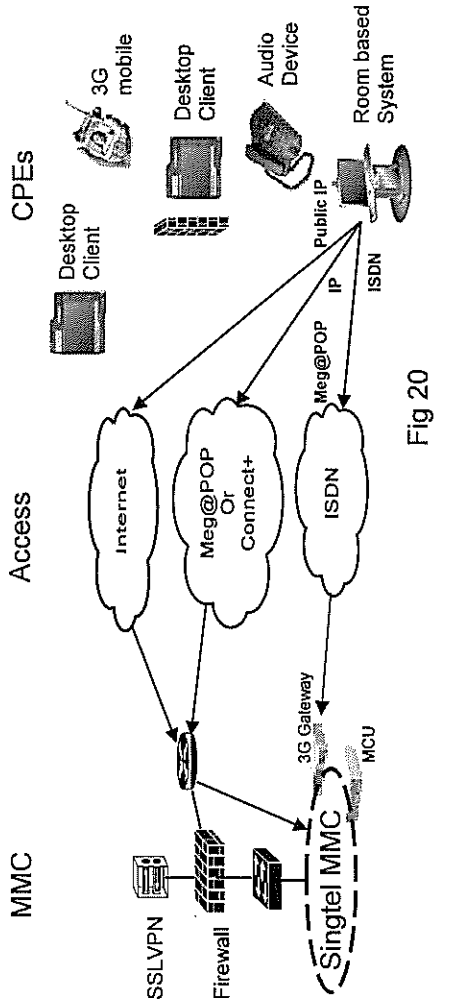

MMC
Access
CPEs
3G mobile
Desktop Client
Audio Device
Room based System
Public IP
IP
ISDN
Meg@POP
Internet
Meg@POP Or Connect+
ISDN
SSLVPN
Firewall
3G Gateway
MCU
Singtel MMC

Fig 20

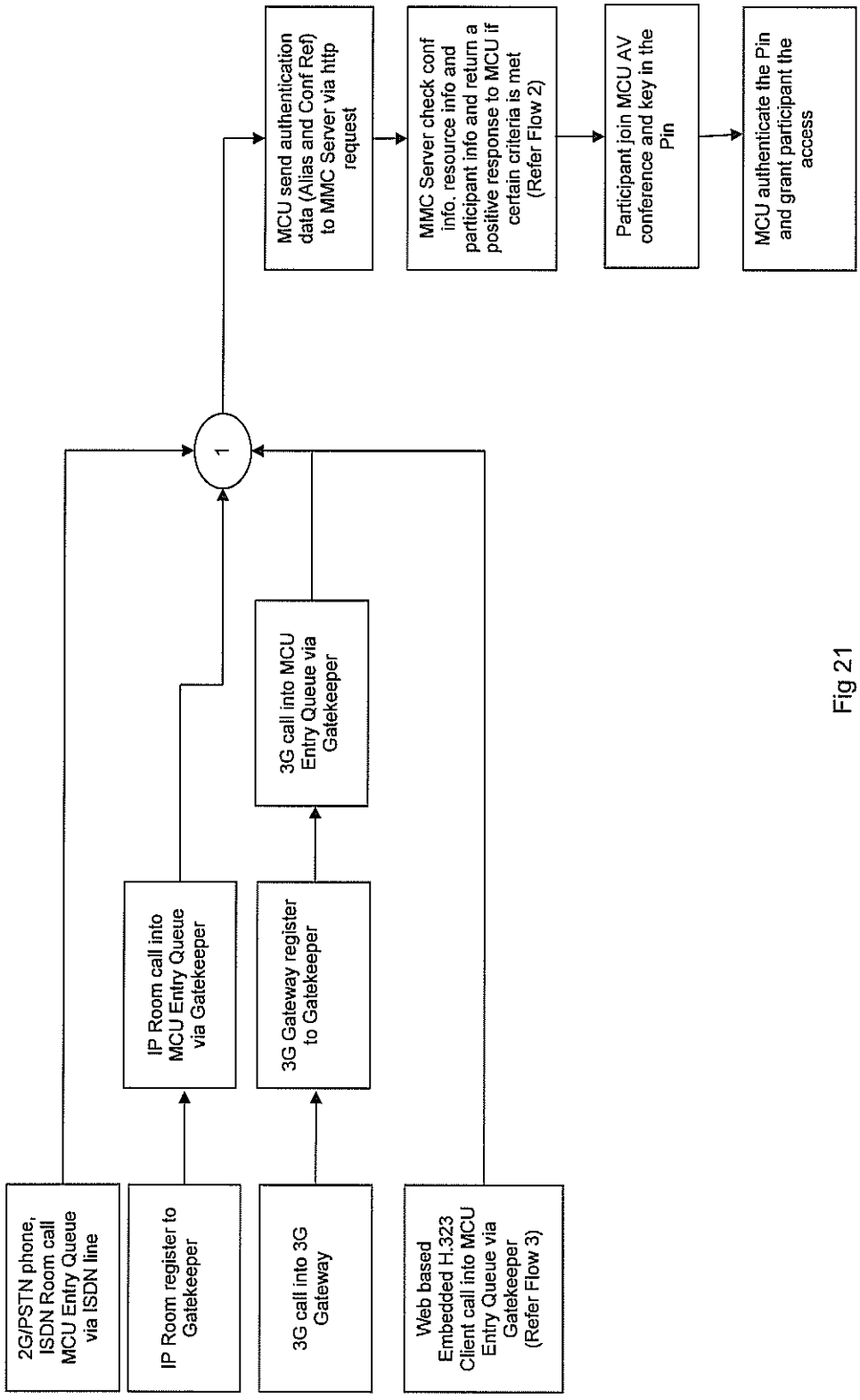

2G/PSTN phone, ISDN Room call MCU Entry Queue via ISDN line
IP Room register to Gatekeeper
3G call into 3G Gateway
Web based Embedded H.323 Client call into MCU Entry Queue via Gatekeeper (Refer Flow 3)
IP Room call into MCU Entry Queue via Gatekeeper
3G Gateway register to Gatekeeper
3G call into MCU Entry Queue via Gatekeeper
1
MCU send authentication data (Alias and Conf Ref) to MMC Server via http request
MMC Server check conf info, resource info and participant info and return a positive response to MCU if certain criteria is met (Refer Flow 2)
Participant join MCU AV conference and key in the Pin
MCU authenticate the Pin and grant participant the access

Fig 21

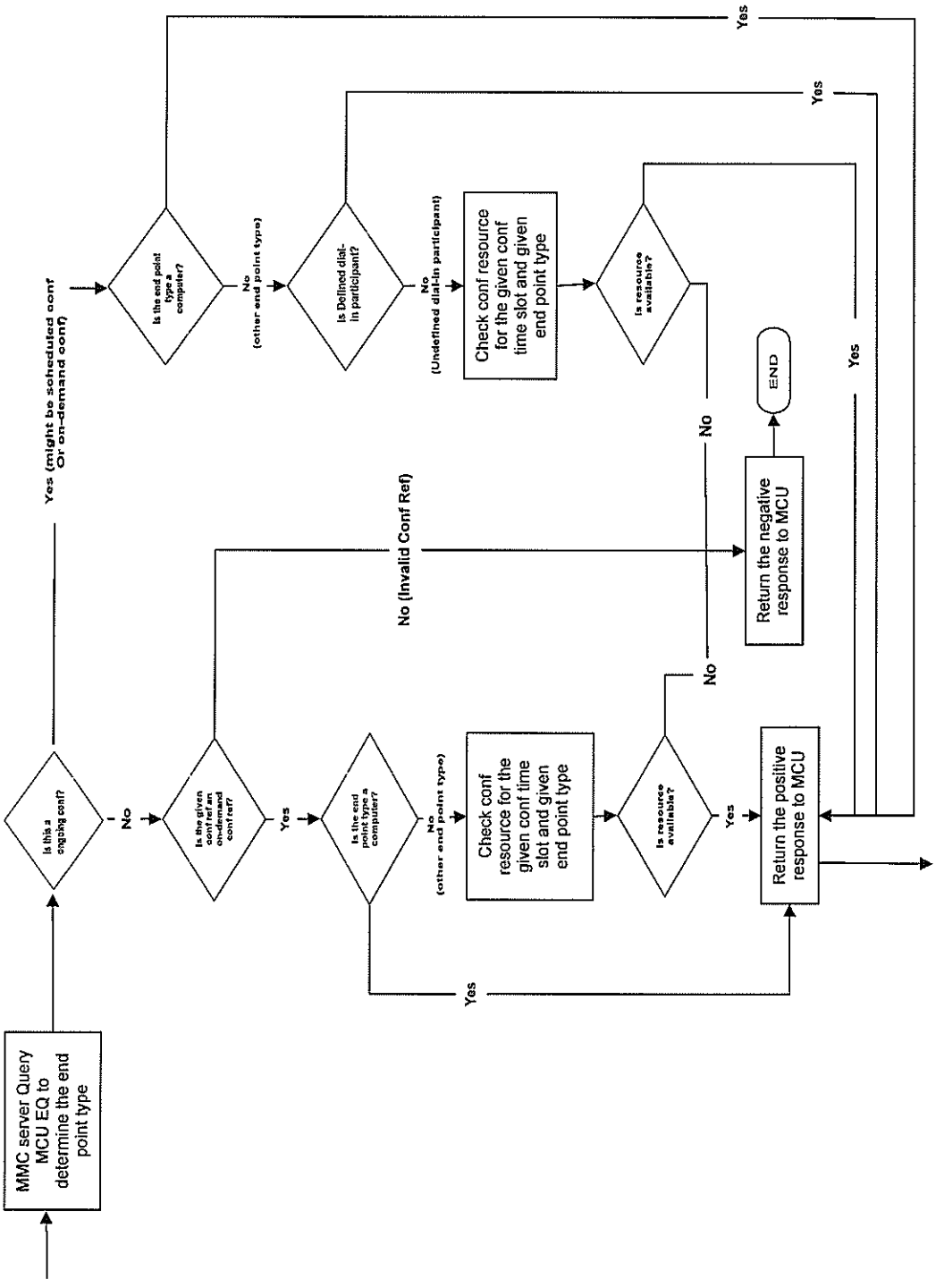

MMC server Query MCU EQ to determine the end point type
Is this a ongoing conf?
Yes (might be scheduled conf Or on-demand conf)
No
Is the given conf ref an on-demand conf ref?
No (Invalid Conf Ref)
Yes
Is the end point type a computer?
Yes
No (other end point type)
Check conf resource for the given conf time slot and given end point type
Is resource available?
No
Yes
Return the negative response to MCU
END
Return the positive response to MCU
Yes
Is the end point type a computer?
No (other end point type)
Is Defined dial-in participant?
No (Undefined dial-in participant)
Check conf resource for the given conf time slot and given end point type
Is resource available?
No
Yes
Yes
Yes

Fig 22

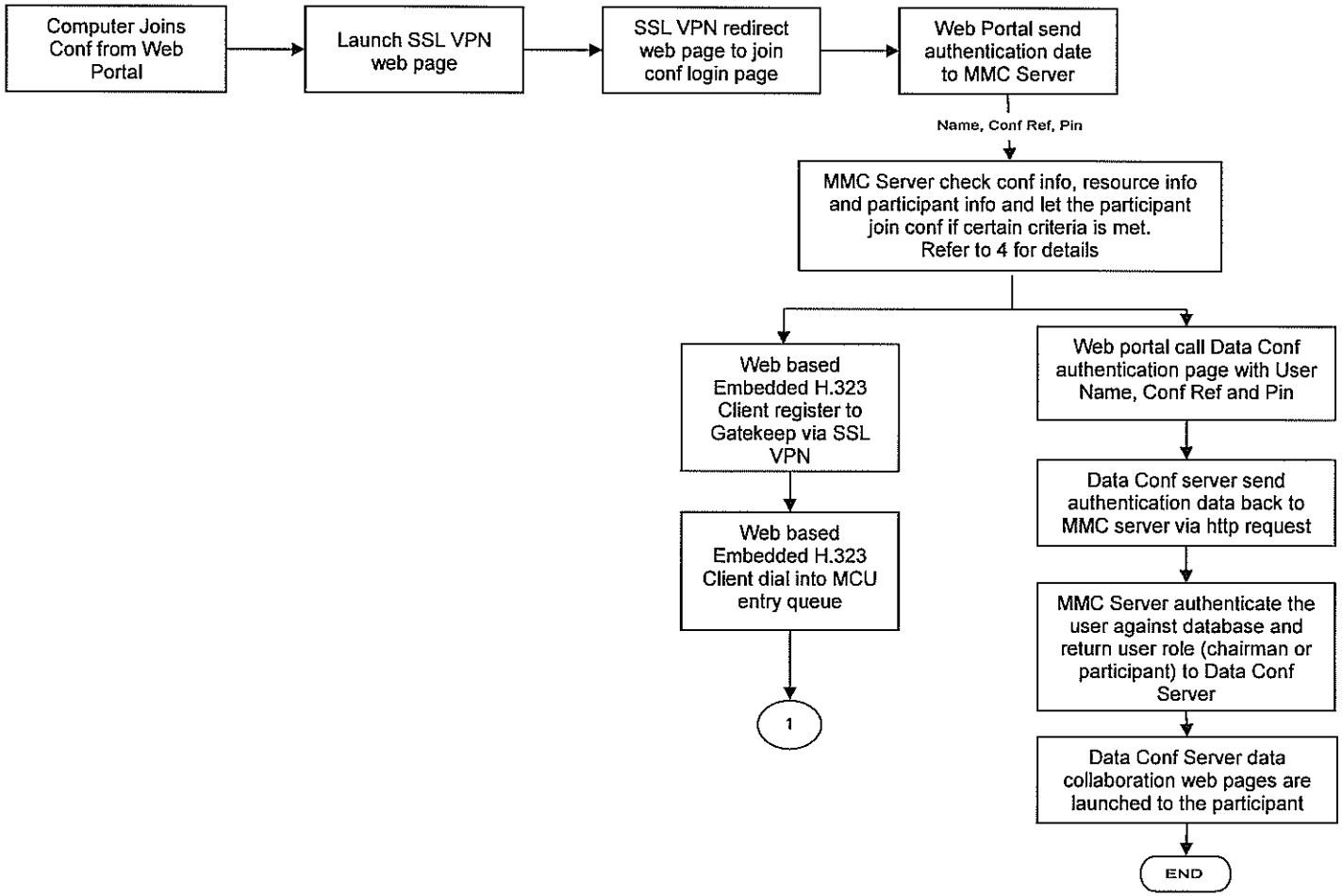

Computer Joins Conf from Web Portal
Launch SSL VPN web page
SSL VPN redirect web page to join conf login page
Web Portal send authentication date to MMC Server
Name, Conf Ref, Pin
MMC Server check conf info, resource info and participant info and let the participant join conf if certain criteria is met. Refer to 4 for details
Web based Embedded H.323 Client register to Gatekeep via SSL VPN
Web based Embedded H.323 Client dial into MCU entry queue
1
Web portal call Data Conf authentication page with User Name, Conf Ref and Pin
Data Conf server send authentication data back to MMC server via http request
MMC Server authenticate the user against database and return user role (chairman or participant) to Data Conf Server
Data Conf Server data collaboration web pages are launched to the participant
END

Fig 23

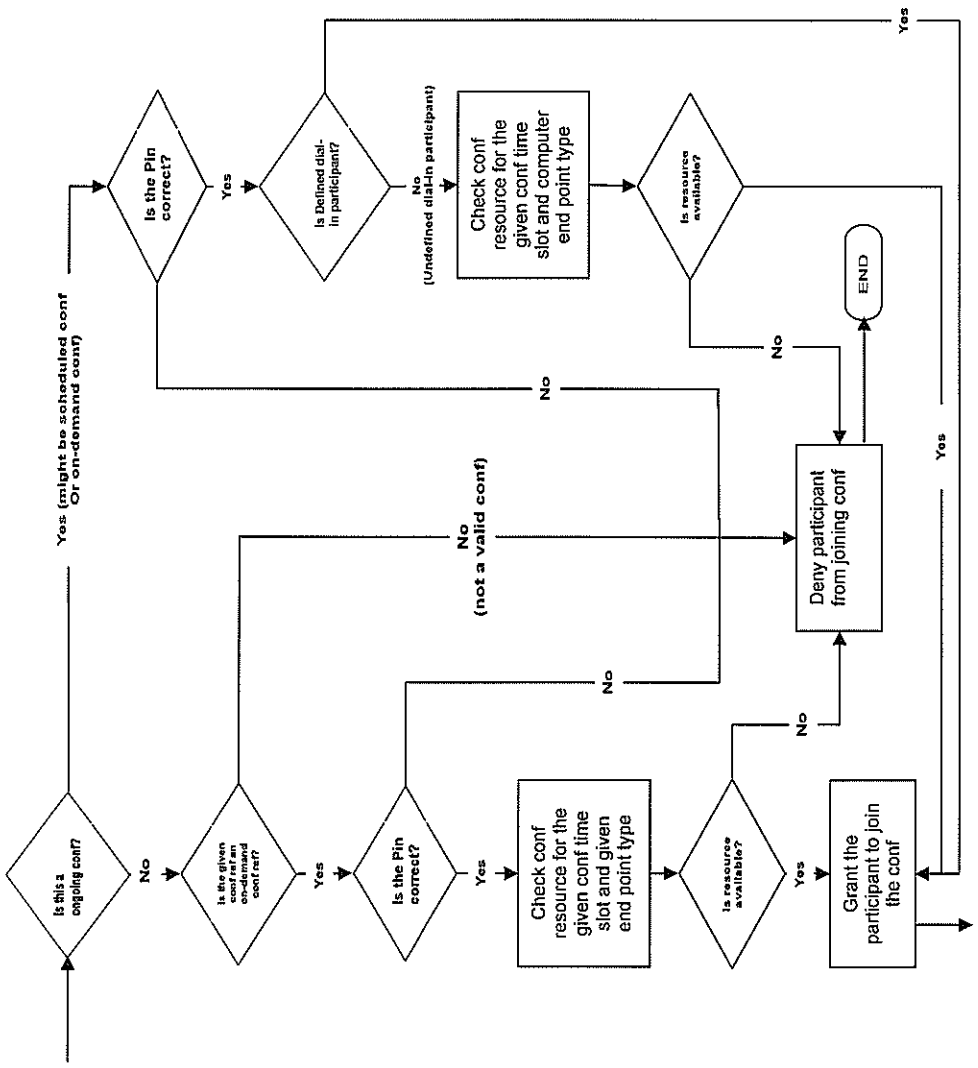

Is this a ongoing conf?
No
Yes (might be scheduled conf Or on-demand conf)
Is the given conf is an on-demand conf ref?
Yes
No (not a valid conf)
Is the Pin correct?
Yes
No
Check conf resource for the given conf time slot and given end point type
Is resource available?
Yes
No
Grant the participant to join the conf
Yes
Deny participant from joining conf
Is the Pin correct?
Yes
No
Is Defined dial-in participant?
No (Undefined dial-in participant)
Check conf resource for the given conf time slot and computer end point type
Is resource available?
Yes
No
END

Fig 24

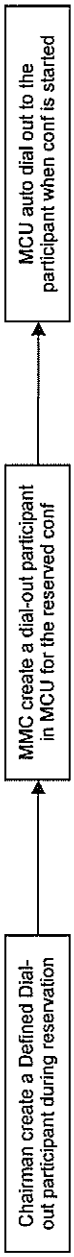

Chairman create a Defined Dial-out participant during reservation
MMC create a dial-out participant in MCU for the reserved conf
MCU auto dial out to the participant when conf is started

Fig 25

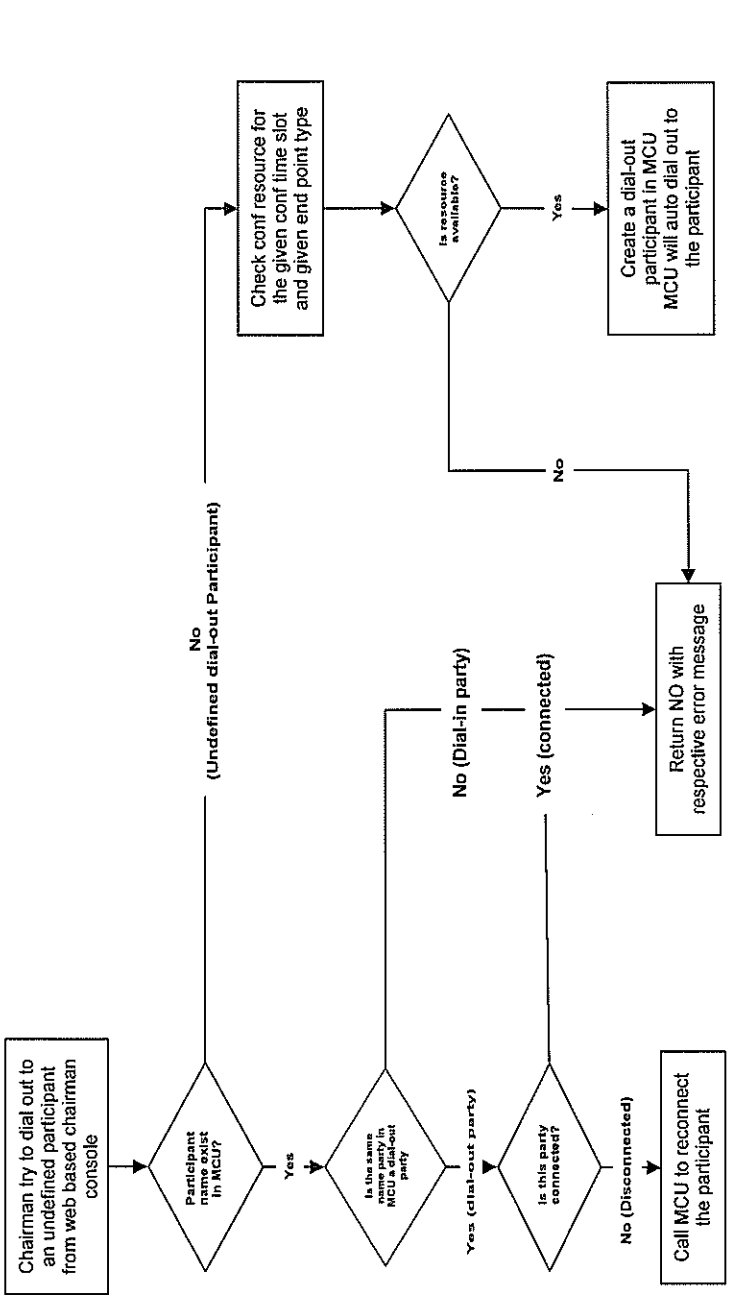

Chairman try to dial out to an undefined participant from web based chairman console
Participant name exist in MCU?
Yes
No
(Undefined dial-out Participant)
Is the same name party in MCU is dial-out party
No (Dial-in party)
Yes (dial-out party)
Is this party connected?
Yes (connected)
No (Disconnected)
Call MCU to reconnect the participant
Check conf resource for the given conf time slot and given end point type
Is resource available?
Yes
No
Create a dial-out participant in MCU MCU will auto dial out to the participant
Return NO with respective error message

Fig 26

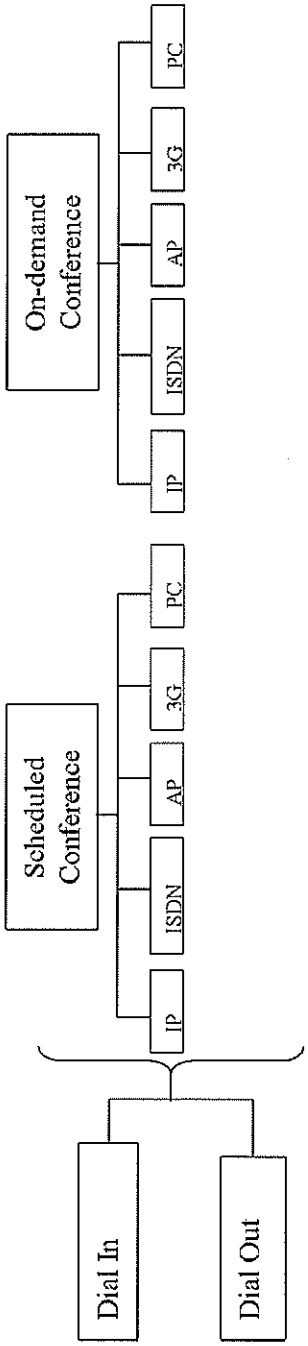

Dial In
Dial Out
Scheduled Conference
IP
ISDN
AP
3G
PC
On-demand Conference
IP
ISDN
AP
3G
PC

Fig 27

End Point Dial In Conference Flow Overview

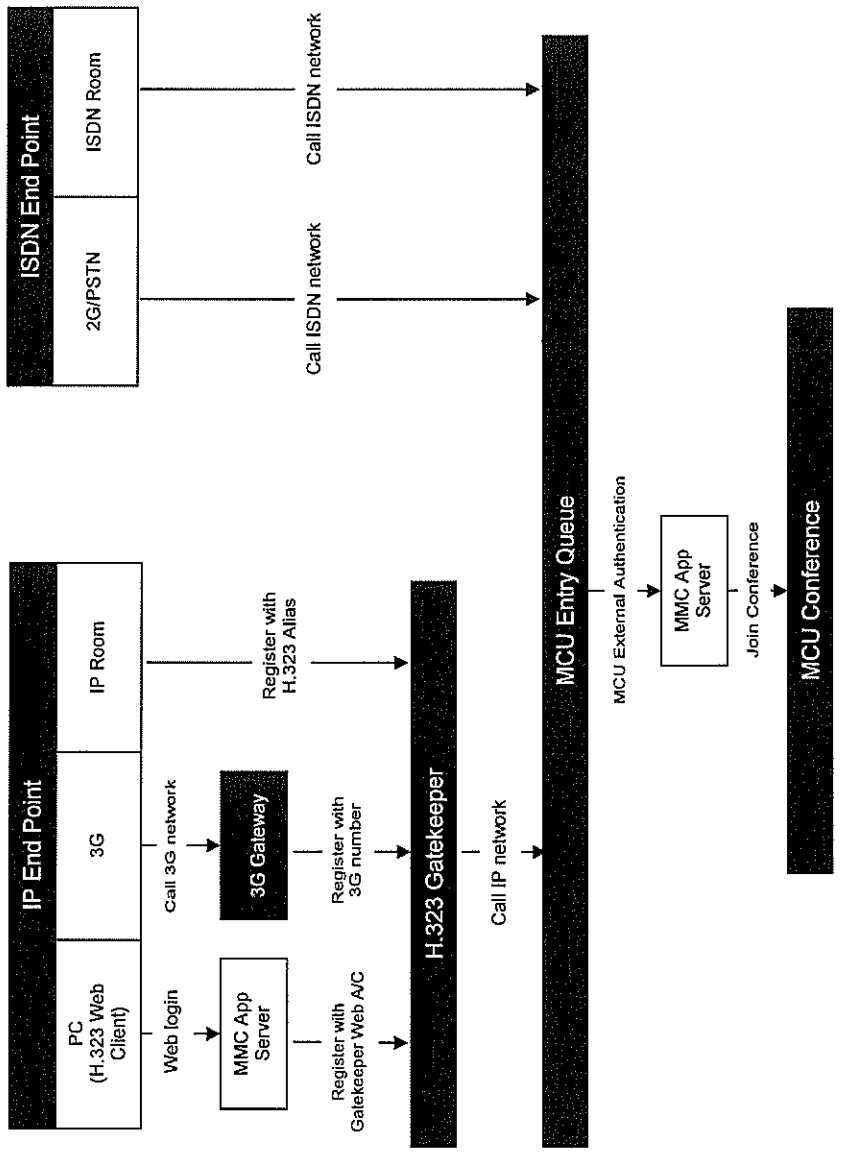


Fig 28

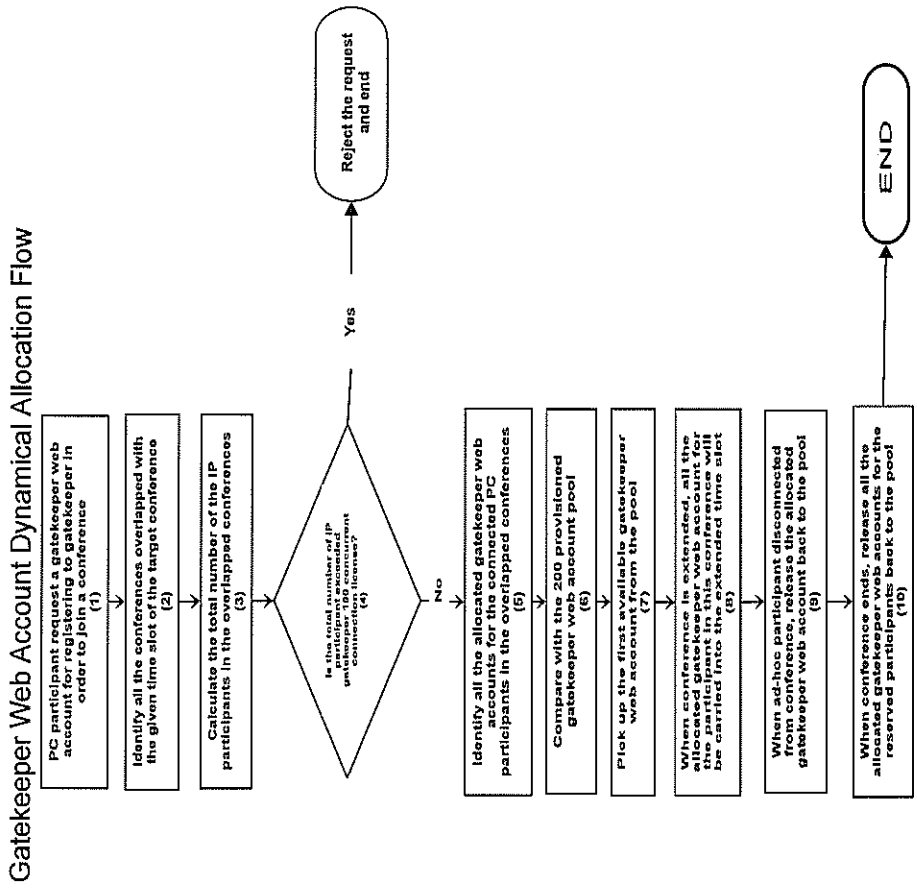

Gatekeeper Web Account Dynamical Allocation Flow
PC participant request a gatekeeper web account for registering to gatekeeper in order to join a conference (1)
Identify all the conferences overlapped with the given time slot of the target conference (2)
Calculate the total number of the IP participants in the overlapped conferences (3)
Is the total number of IP participant exceeded gatekeeper 200 concurrent connections limited? (4)
Yes
Reject the request and end
No
Identify all the allocated gatekeeper web accounts for the connected PC participants in the overlapped conferences (5)
Compare with the 200 provisioned gatekeeper web account pool (6)
Pick up the first available gatekeeper web account from the pool (7)
When conference is extended, all the allocated gatekeeper web account for the participants in the conference will be carried into the extended time slot (8)
When ad-hoc participant disconnected from conference, release the allocated gatekeeper web account back to the pool (9)
When conference ends, release all the allocated gatekeeper web accounts for the reserved participants back to the pool (10)
END

Fig 29

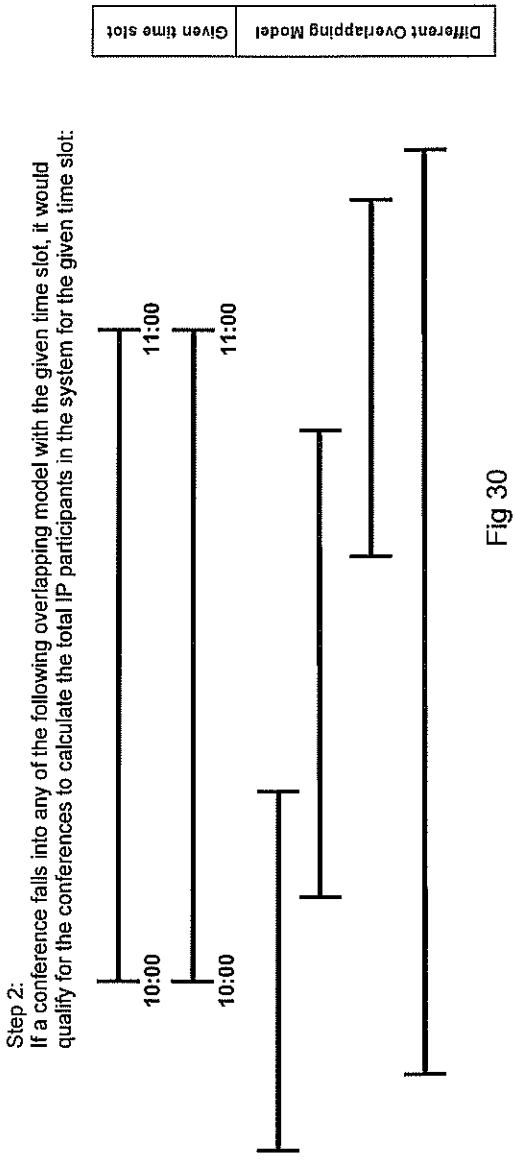

Step 2:
If a conference falls into any of the following overlapping model with the given time slot, it would qualify for the conferences to calculate the total IP participants in the system for the given time slot:
Different Overlapping Model
Given time slot
10:00
11:00
10:00
11:00

Fig 30

Step 4:
Calculate the total number of the IP participants in the system for the given time slot, it should not exceed the total gatekeeper 100 concurrent connection licenses.
Total PC Participants
Connected
Reserved
Total 3G Participants
Connected
Reserved
Total IP Room Participants
Connected
Reserved
<=100 Gatekeeper A/C
10:00
11:00

Fig 31

Step 5, 6, 7:
Dynamically pick up an available gatekeeper web account from the pool and assign it to the requesting PC participant for registering to gatekeeper.

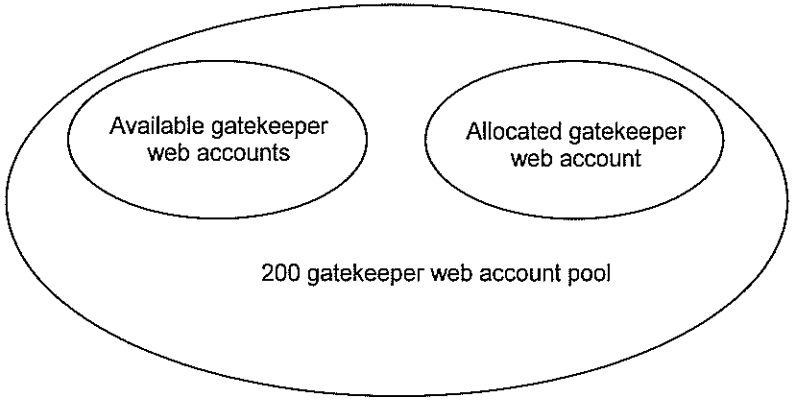


Fig 32