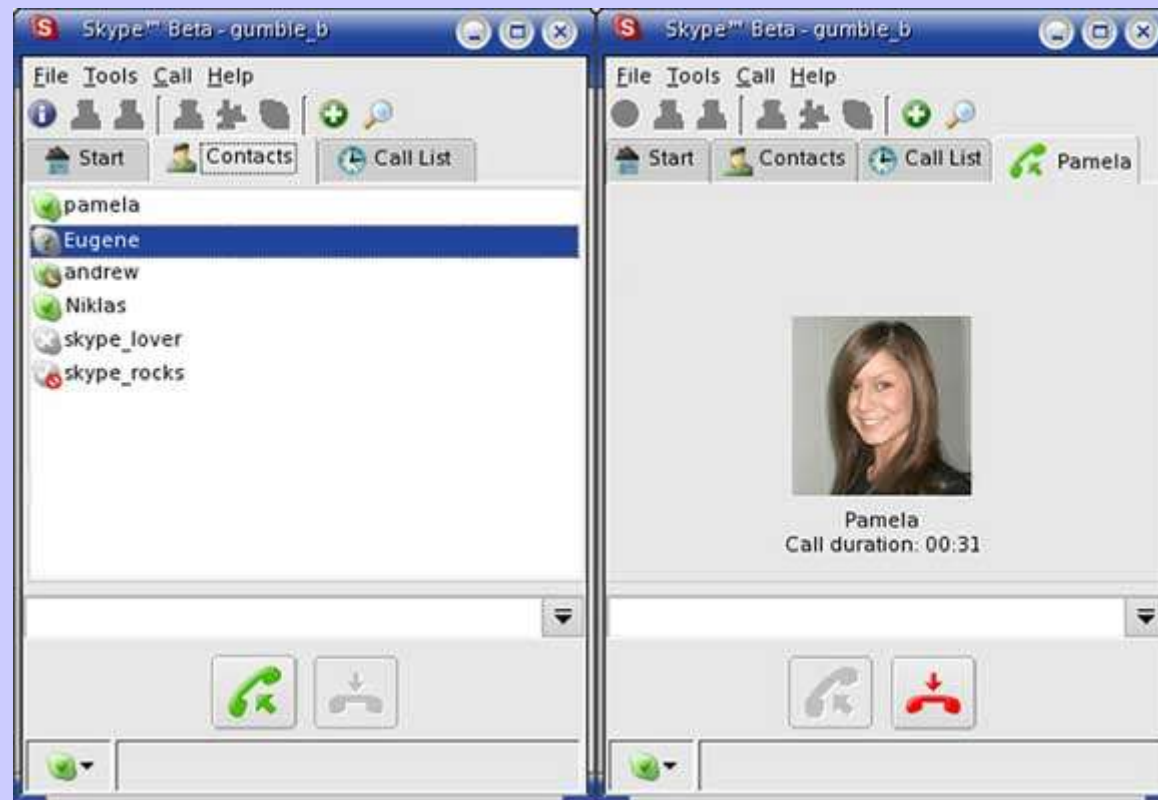


# *Peer-to-Peer Internet Telephone*

## *Skype*



Qihua Shang

# Content:

1. Introduction of Skype
2. What is Peer-toPeer architecturee
3. Some keywords of Skype
4. Important functions of skype
5. Conferencing
6. Conclusion & future develepement

# *Introduction*

peer-to-peer VoIP client developed by KaZaa

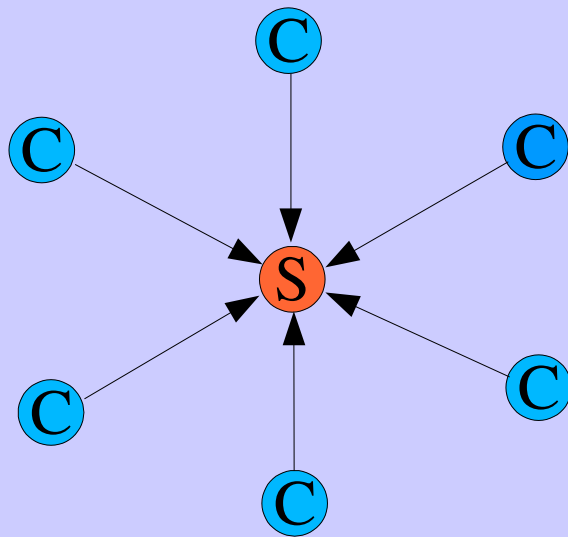
Voice Call, message sending  
audio conferencing.

Similar to the MSN, X-lite, ...

protocols and techniques are quite different

# Client-Serveer vs. Peer-to-Peer architecture

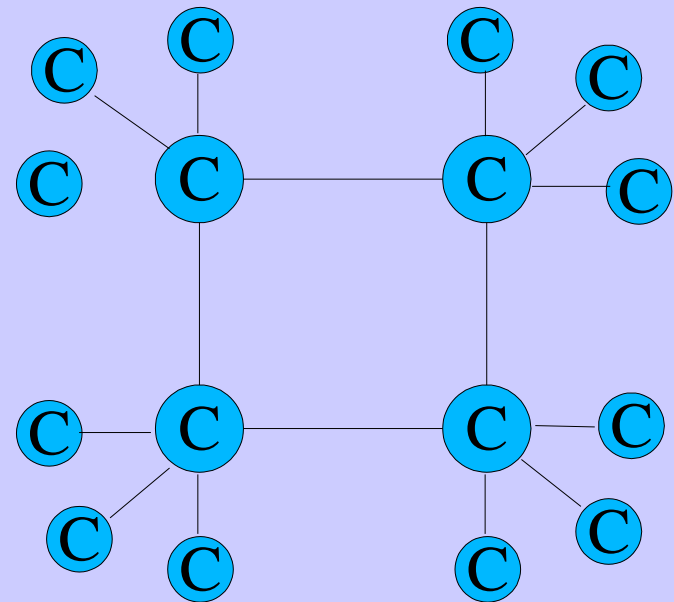
# Client-Server



**C** : Client

**S** : Server

# Peer-to-Peer



**C** : Ordinary host

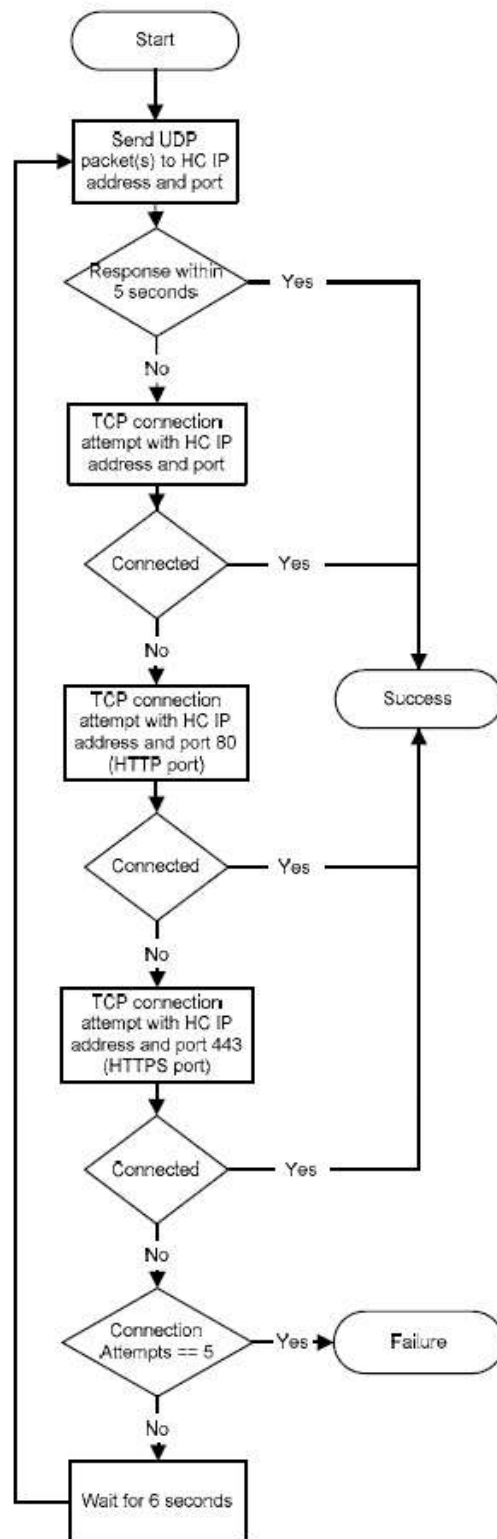
**C** : Super node

## *Some keywords of Skype*

- ★ Ports(a TCP and UDP listening port)
- ★ Host Cache(listing of super node)
- ★ Codecs(50-8000 Hz, wideband)
- ★ Buddy List (local machine)
- ★ Encryption (AES with 256 bits)
- ★ NAT and Firewall (STUN portocal)
- ★ Skype Login Server(user name, password)

# *Important functions of skype*

1. Startup (Http 1.1 GET)
2. Login (most critical function)



4 of 7 super nodes(UDP)

Reason: firewall

1 of 7 super node(TCP)

Success: send UDP to some(20) nodes

Port 80: normally open

Https port: 443

Process repeats 4 times more

Failure message

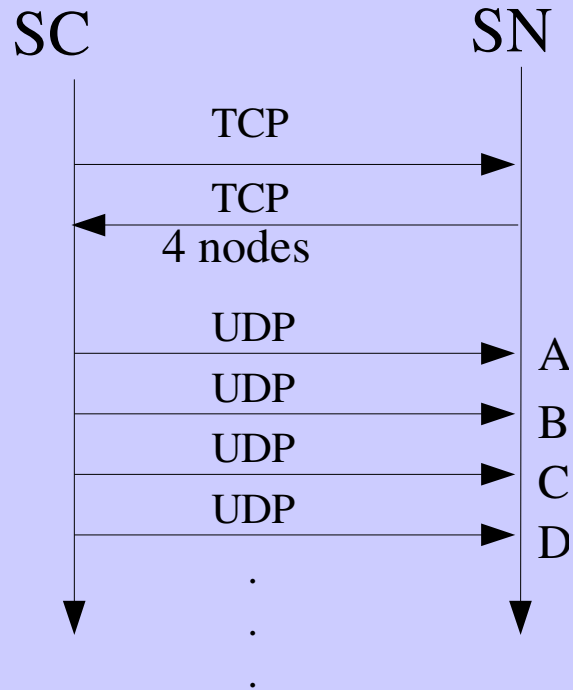
# *Important functions of skype*

1. Startup
2. Login
3. User Search (Global Index technology)

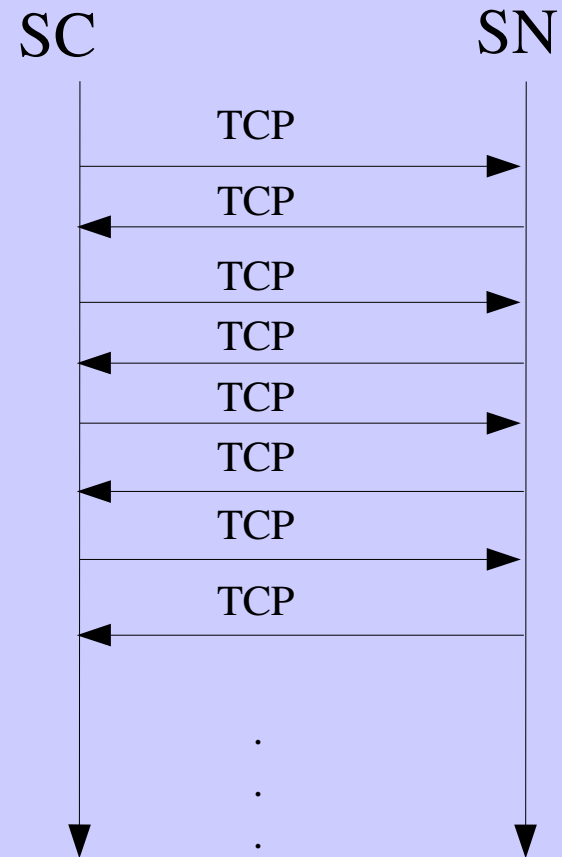


# User Search

Skype client      Super node



Skype client in public address



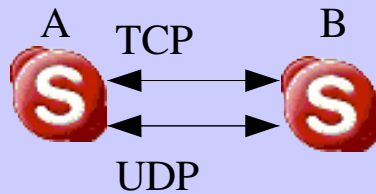
Skype behind a port-restricted NAT and  
UDP-restricted firewall

# *Important functions of skype*

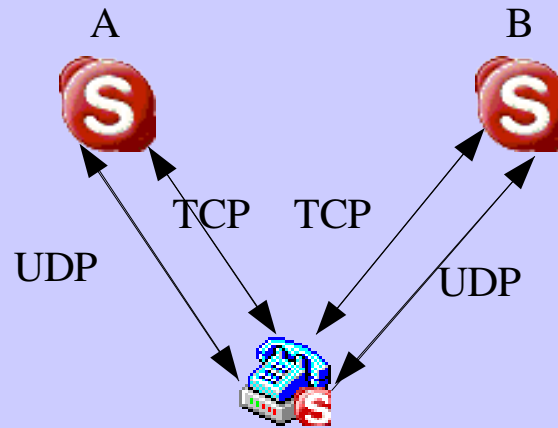
1. Startup
2. Login
3. User Search (Global Index technology)
4. Call Establishment

# Call Establishment

Public IP Address

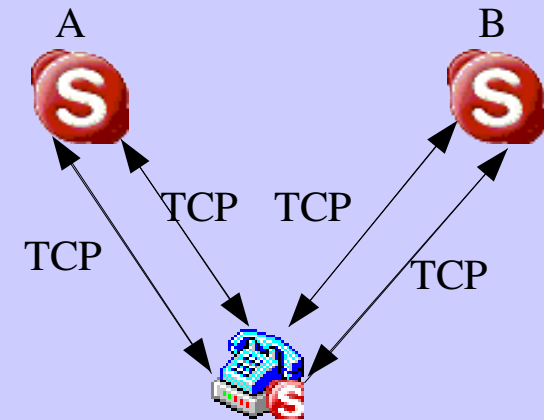


Behind port restricted NAT



Online Skype node

Both Behind port-restricted NAT  
UDP-restricted firewall



Online Skype node

Signaling: TCP

Media: UDP

Signaling: TCP

Media: UDP

67bytes/packet

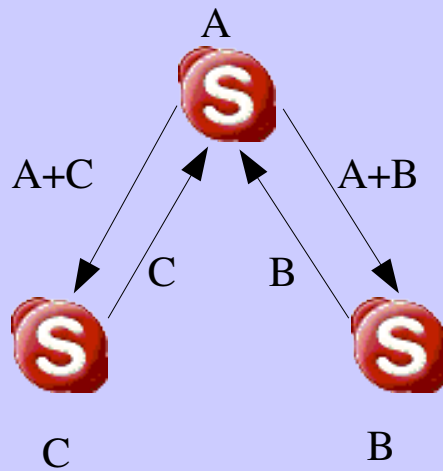
Signaling: TCP

Media: TCP

69bytes/packet

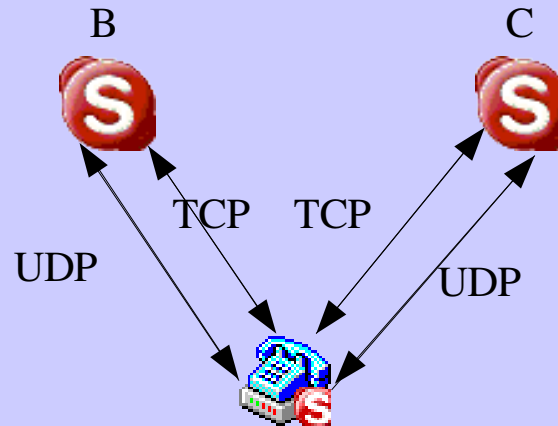
# Conferencing

Public IP Address



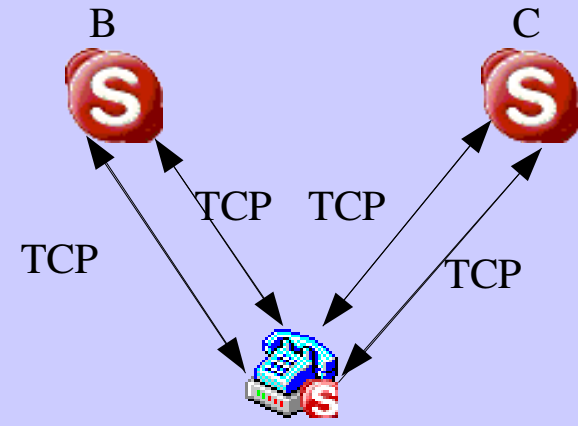
A public IP address

B and C Behind port restricted NAT



Online Skype node

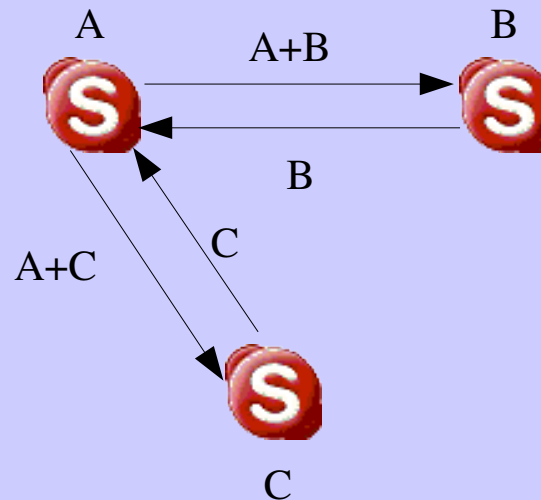
B and C Behind port restricted NAT and  
UDP-restricted firewall



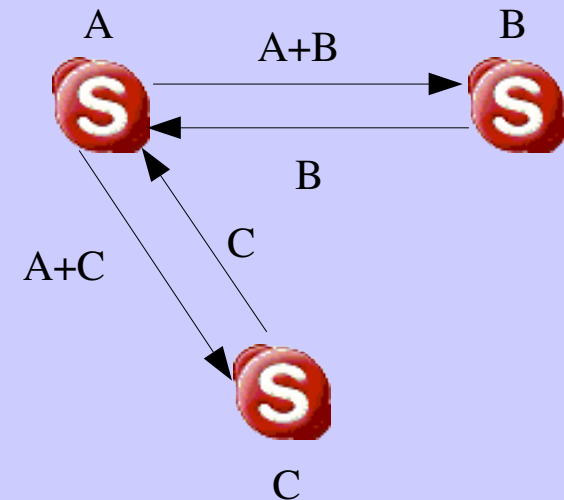
Online Skype node

Mixer: A

Media: UDP



Media: UDP



Media: TCP

## *Conclusion*

1. Skype Provides better voice quality
2. Skype can work behind NATs and firewall
3. Easy to install and use
4. different operating system
5. Signaling: TCP    Media transform: UDP or TCP

# *References*

An Analysis of the skype Peer-to-Peer Internet Telephony Protocol

Salman A. Baset and Henning Schulzrinne

Department of Computer Science

Columbia University, New York NY 10027

September 15, 2004