P2P-SIP Deployment Models

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P2P-SIP Models

3 Models

- SIP server uses DHT (distributed hash table) for looking up current contact address

- Distributed SIP proxies host the DHT
  - Clients request is forwarded by the SIP proxies based on p2p lookup (proxy mode)
  - Clients perform look up using the proxies and initiate direct connection (redirect mode)

- Clients participate in hosting DHT, clients act as P2P nodes.
P2P-SIP Signaling: Model 1

- SIP server use P2P based DHT for look up
  - DHT as a network service
  - SIP Proxy can become point of failure
    - Not really P2P
  - Capability needed in clients to fallback and use the DHT service directly when proxy fails
- Who hosts DHT service
  - Capable clients
- Can be considered for enterprise networks
P2P-SIP Signaling: Model 2

- P2P in SIP proxies (Distributed Proxies)
  - Distributed proxies provide DHT service
  - Proxies are distributed at network access points e.g. Wireless Access Points,
  - Proxies can relay or forward requests or can act as look up service providers
    - SIP Proxy mode or Redirect mode
    - Proxy mode in P2P useful for NAT/Firewall
  - Registration to proxy=>Store in DHT
  - No change in existing clients needed: evolutionary
  - Client must not depend on local proxy
P2P-SIP Signaling: Model 3

P2P in end points

- Different types of end point and end points capability
- Wireless endpoints
  - Impact of mobility on number of messages, power utilization and network utilization
- Not all end point can participate to PROVIDE DHT look up as a SERVICE
- Clients use look up service from other clients and proxies who are participating in P2P network
P2P-SIP Media: Models

- Media over p2p overlay
  - Route around failures
  - Emergency traffic
  - QoS
  - Firewalls/NAT’s
- Measurement overheads can be involved
Current Implementation Architecture

P2P Network (DHT Service)

SIP Proxy on P2P Substrate

Enterprise Deployment

Clients acting as P2P nodes

Our typical deployment model

DHCP
Current Implementation: Case 1

IP PBX exists and is working
- Phone comes into wireless zone
- Acquires IP address using DHCP
- Requires address of IP-PBX
  - Either in DHCP options header
  - DHCP like request
- Registers to the IP-PBX – Information about this phone stored in DHT
- Can make calls
  - Lookup at Server
  - Forwarding at Server
Current Implementation: Case 2

IP PBX doesn’t exist or is not working
- Phone comes into wireless zone
- Acquires IP address using DHCP
- Requires address of IP-PBX
  - Doesn’t get it in DHCP response
  - Either gets it from bootstrap server or uses the one in local cache
- Registers to the IP-PBX – disseminate its reach-ability info
- Making calls
  - Lookup at Server (IP-PBX)
  - Forwarding at Server (IP-PBX)
Advantages

- Self organizing
  - Works even if server down
  - Inbuilt resiliency and reliability
- Plug and Play
- Low cost
- Media overlay
  - Best path
  - Alternate path (useful for emergency situation)
Open problems

- Voice mail
- 911
- Interoperability between multiple P2P islands based on different substrates (algorithms)
- Trust – Identity – Anonymity
- Security