ALTO Relay Usage in Real-time Communication

<draft-meng-alto-relay-00.txt>

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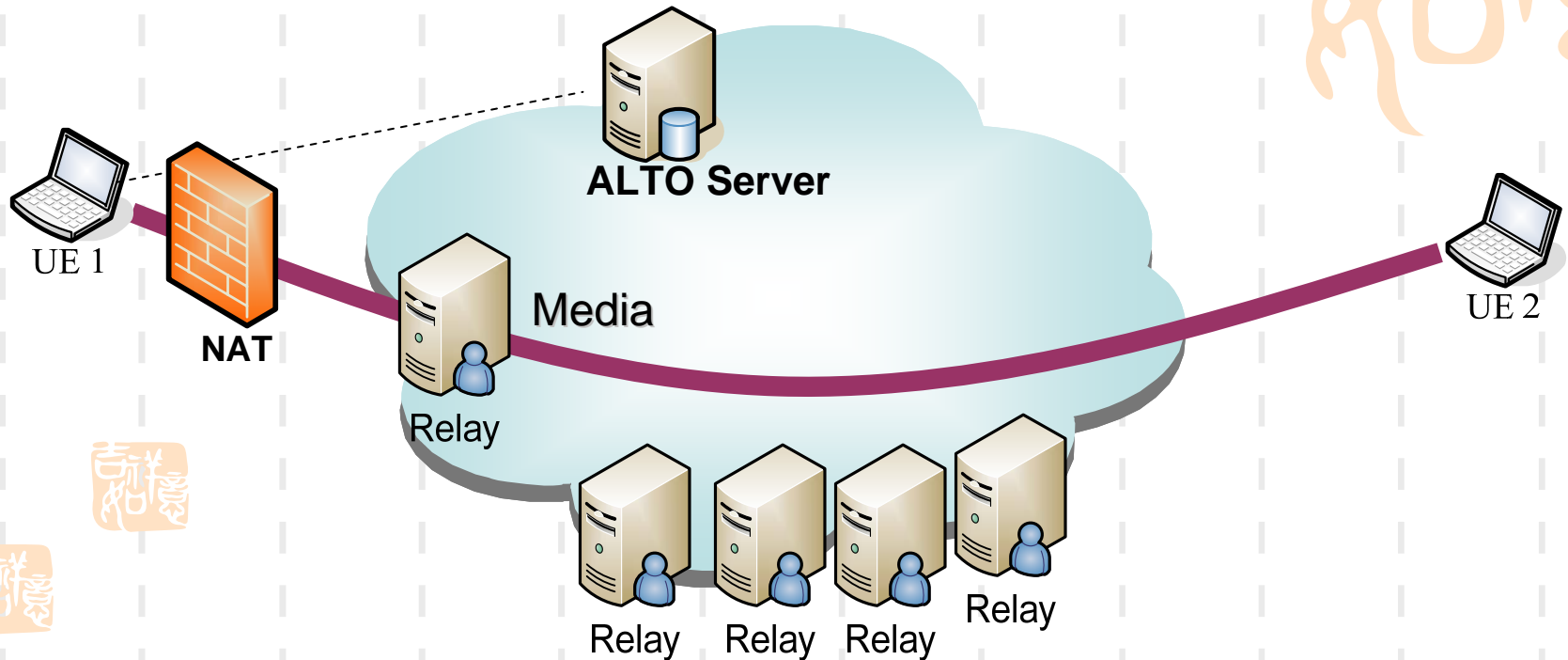# Relay usage in real time communication

- **Relay for connectivity**

- Relay for improving QoS

Connectivity Relay

- When UE is behind NATs, firewalls or Proxies, relay is needed for connectivity
- Relay node has a public address
- ALTO solution helps to find optimal Relay Node
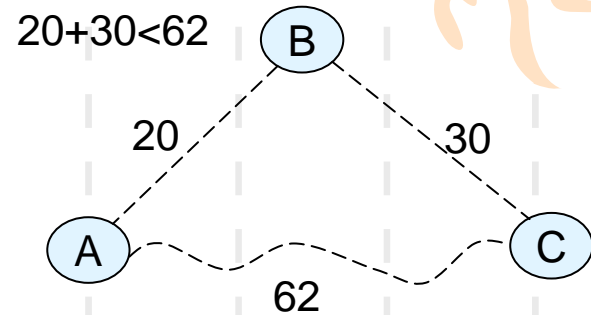
Relay usage in real time communication

- Relay for connectivity
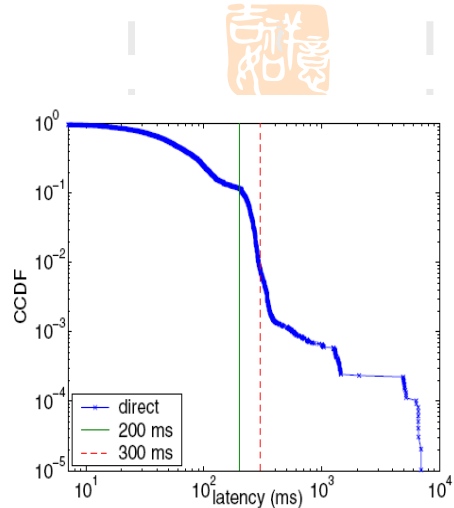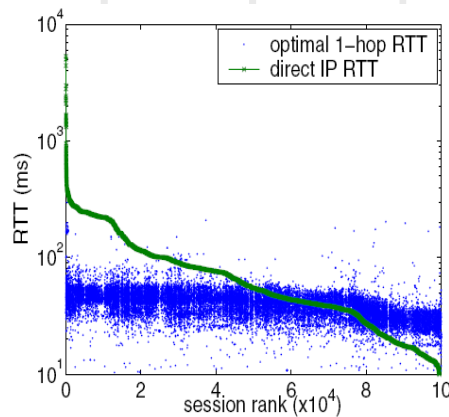
- **Relay for QoS improvement**

TIVs phenomenon

- Triangle Inequality Violations (TIVs) is a natural, widespread phenomenon in internet

- Opportunities exist for improving QoS by relay

20+30<62

B

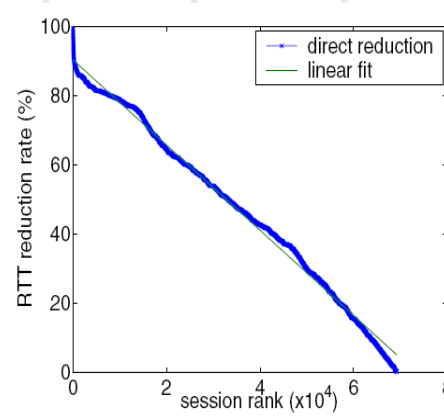20   30

A   C

62

Example of TIVs,
Source – Triangle Inequality and
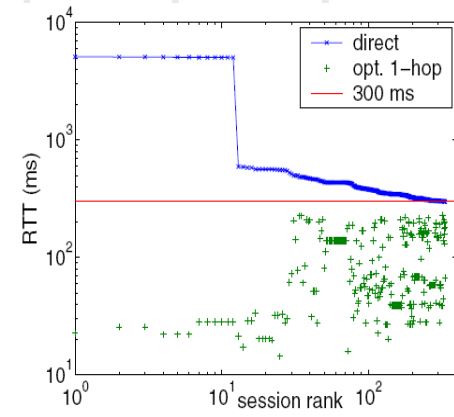Routing Policy Violations in the internet

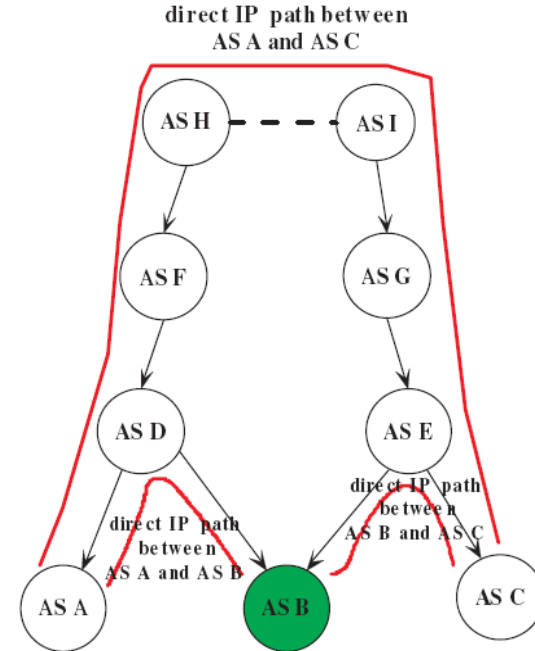(a) Direct IP routing

(b) Direct and optimal 1-hop routing

(a) Optimal 1-hop RTTs reduction ratio.

(b) Direct and optimal 1-hop RTTs for latent sessions.

Source - ASAP: an AS-Aware Peer-Relay Protocol for High Quality VoIP
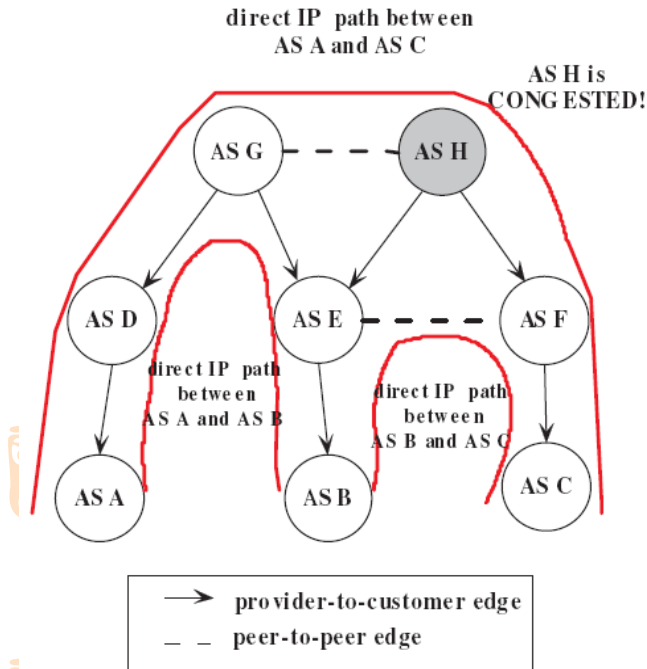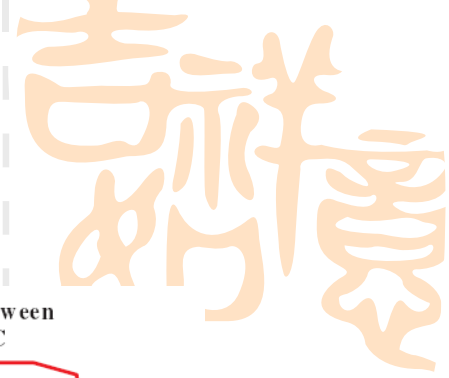
When QoS Relay

Source - ASAP: an AS-Aware Peer-Relay Protocol for High Quality VoIP

- Two scenarios for QoS Relay:
  - ➢ An AS in a direct routing path is congested or failed.
  - ➢ When overlay routing can be further improved by Multi-homed customer ASes.

Application case of QoS Relay

Akamai Edge Server automatically detects when the path to an origin server is inaccessible and invokes SureRoute for Failover to find an alternative path to reach the origin server.
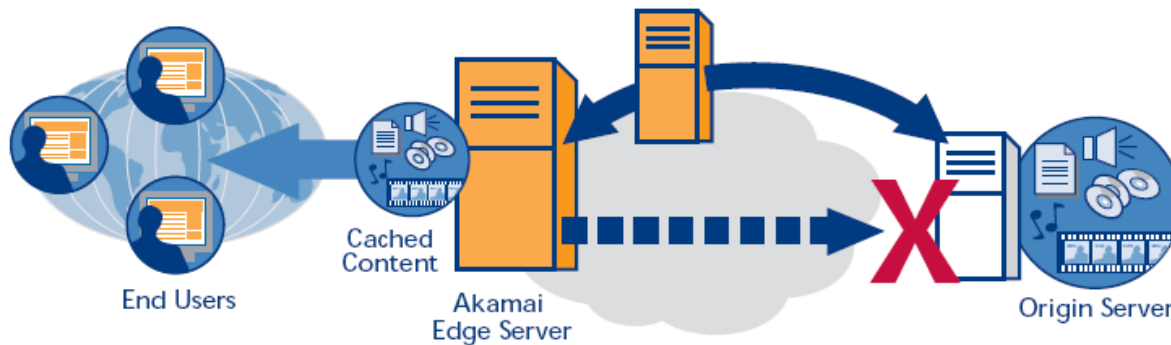
Akamai's SureRoute for Failover

Akamai SureRoute for Performance continually "races" to find the fastest path to an origin server, ensuring content is delivered in the quickest fashion.
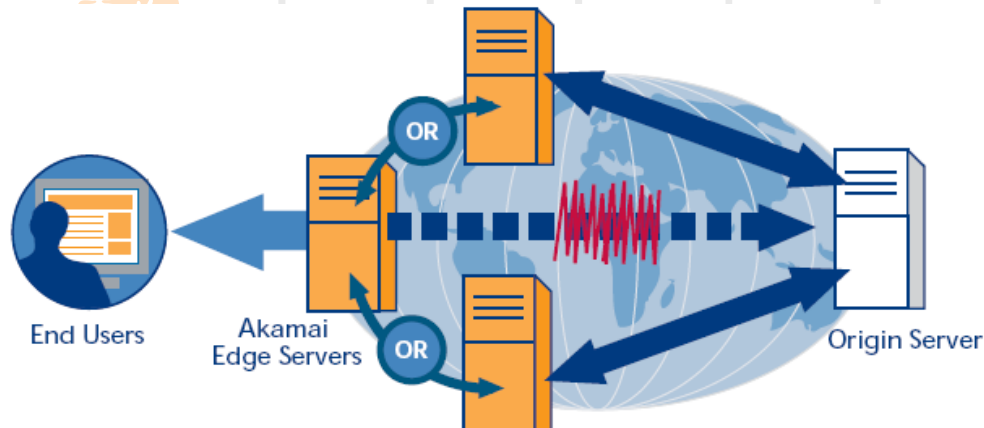
Akamai's SureRoute for Performance

Source - http://www.akamai.com/

How ALTO solution works in QoS Relay selection

- **Option 1:**
  - ➤ ALTO Server receives source IP, destination IP, and relay list.
  - ➤ ALTO Server gives the suggestion on relay selection.

- **Option 2:**
  - ➤ ALTO Server in AS1 receives source IP and relay list1;
  - ➤ ALTO Server in AS2 receives destination IP and relay list2;
  - ➤ Relay management entity or UE decide the relay considering the suggestion from AS1 and AS2

- **More?**
  - ➤ For Further Study

Advantage of QoS Relay

- Easier for implementation through application layer control
  - Don't need any change on IP infrastructure
- Faster to get the alternative path when routing failure
  - Application layer detection, eg. Ping.
  - While, suffering from path exploration, route withdrawal delays often last up to a couple of minutes for global routing policy [RFC 4984]
- Can adjust the QoS according to the application demand
  - The QoS requirement and current QoS status can be precisely detected by the application layer, while (diffserv, rsvp) still can't fulfill that
  - BGP is not aware of IP layer congestion

Summary & Next Steps

- Conclusion:
  - ➢ Relay is an optimized solution when IP direct Routing fails, congests, or can't meet the QoS requirement
  - ➢ ALTO solution helps to get good relay node
- Draft will continue to:
  - ➢ Detail the ALTO solution on helping relay node selection
  - ➢ Define the ALTO interface for relay selection
- Comments are always appreciated.

Thanks!