Similar problems

ALTO BOF - IETF 72
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[1] Université catholique de Louvain
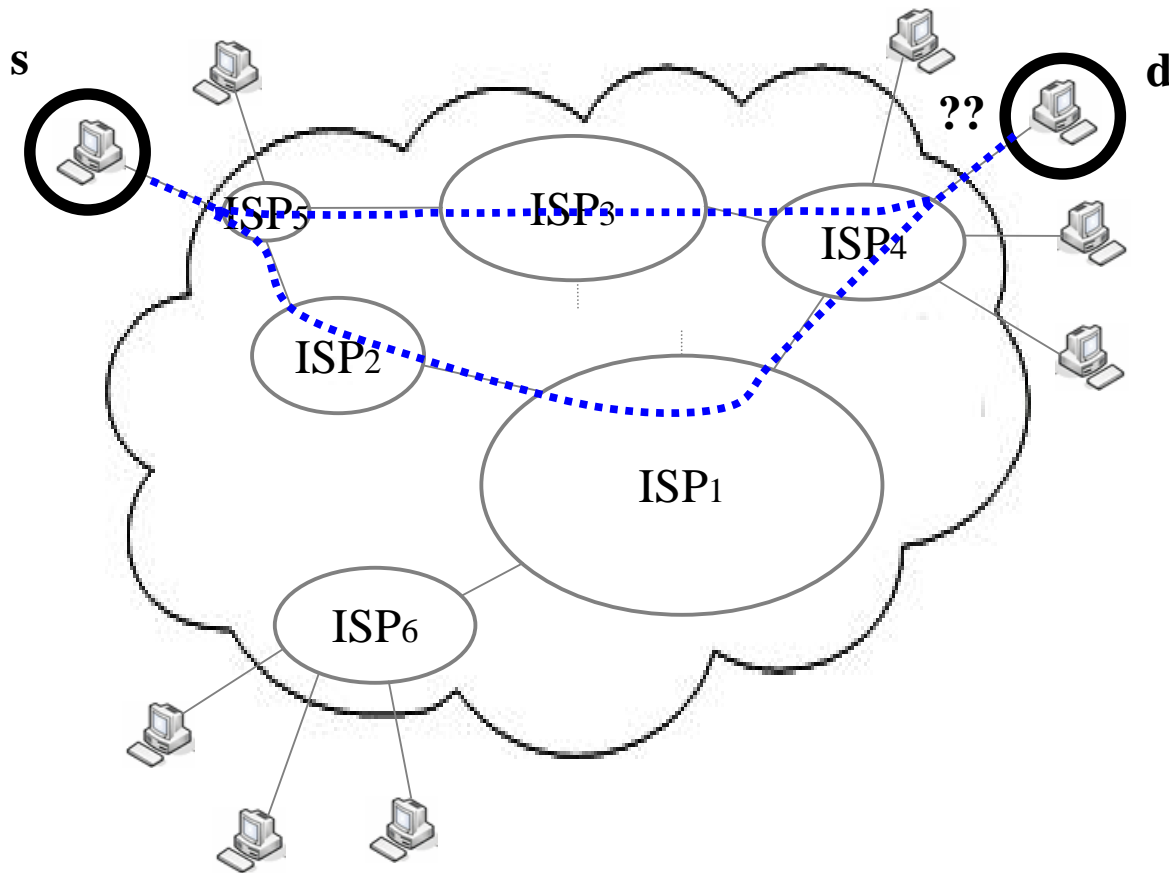**[2] Alcatel Bell**
[3] Cisco Systems

IPv4 vs IPv6 Dual Stack (DS)

- Dual stack hosts/routers will exist for many years

  - IPv4 and IPv6 performance (e.g., reliability) are not always equivalent [1]

- How to select the best stack ?

  - Example: always prefer IPv6 (like Windows Vista)? RFC 3484 static selection ?

=> determine the best path among several: $\{<s_{IPv4}, d_{IPv4}>, <s_{IPv6}, d_{IPv6}>\}$
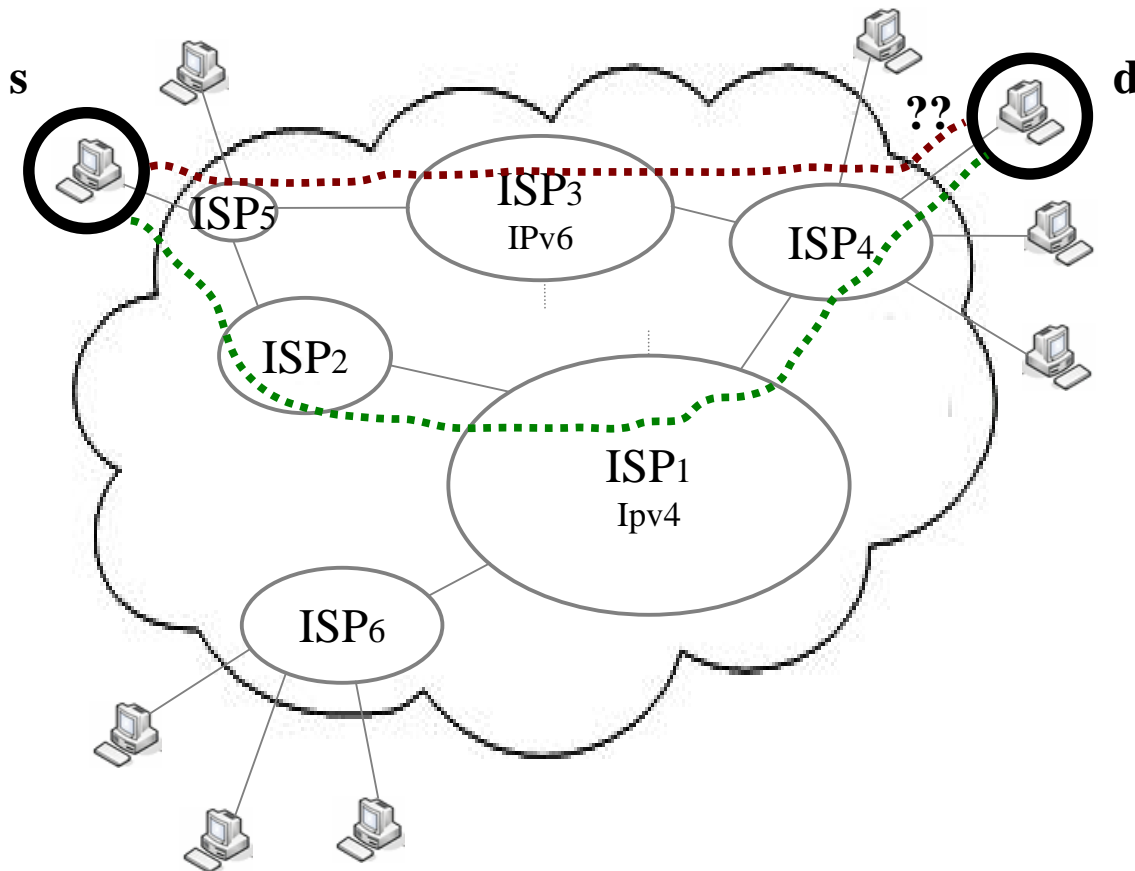
Multi-Homing (MH)

- Multi-homing implies choice among multiple feasible paths with much varying properties [2]

  - AS-based MH: how to select the best path (ISP-based objectives)

  - Host-based MH: how to select the best path (customer-based objectives)

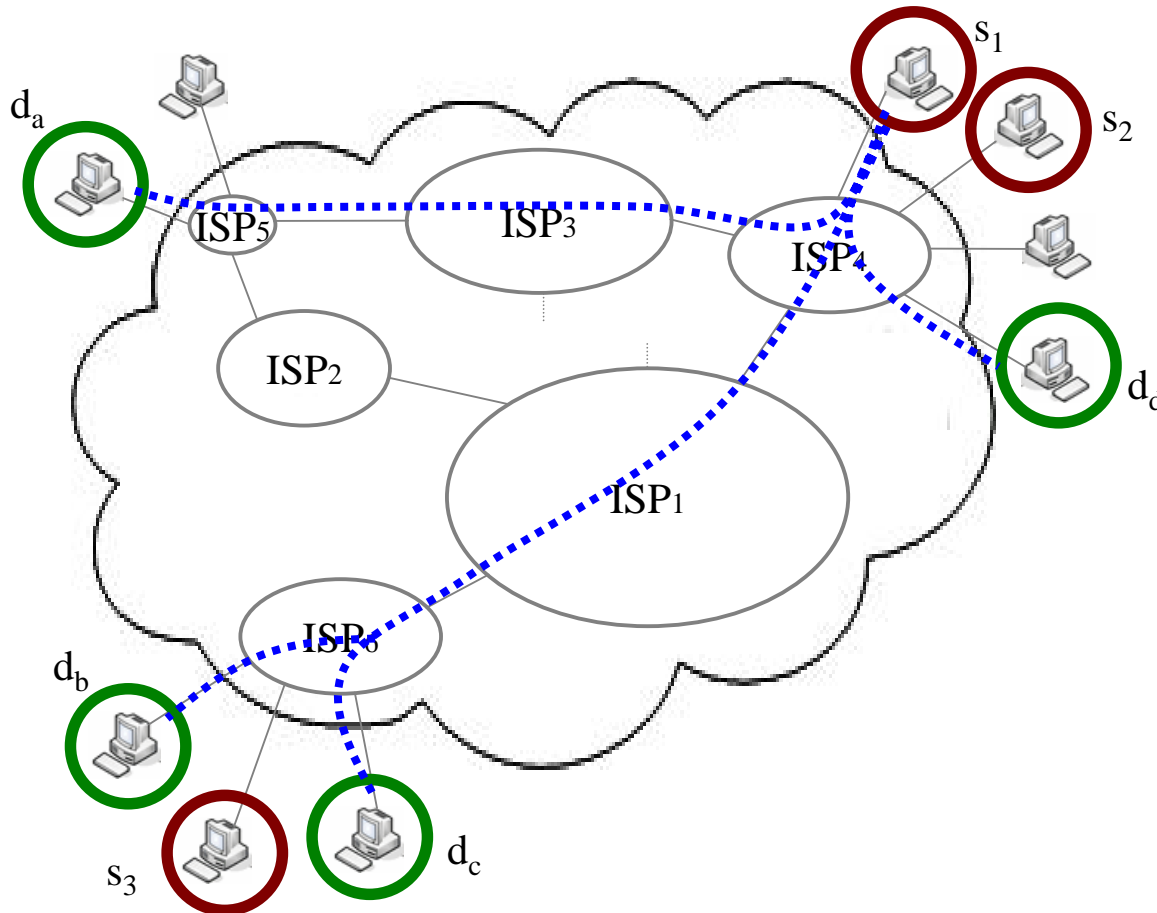=> determine the best path among several: $\{<s_1,d_1>, \ldots, <s_1,d_n>, <s_2,d_1>, \ldots, <s_m,d_n>\}$

Server replicas

- How to select the best replicas
  - within set $\{d_a, d_b, d_c, d_d\}$
  - per source: s_1, s_2, s_3

=> determine the best replicaS among several: $\{<s_i,d_a>, <s_i,d_b>, <s_i,d_c>, <s_i,d_d>\}$ $\forall$ i
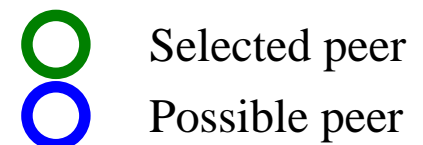
ALTO Best Peer Selection

- How to select the best peers set from the swarm

  - Example: selected peer set $\{p_a, p_c, p_g\}$ extracted from possible set $\{p_a, p_b, p_c, p_d, p_e, p_f, p_g, p_h\}$

  - per source: s_1

=> determine the best peerS among several: $\{<s, p_a>, \ldots, <s, p_g>\}$
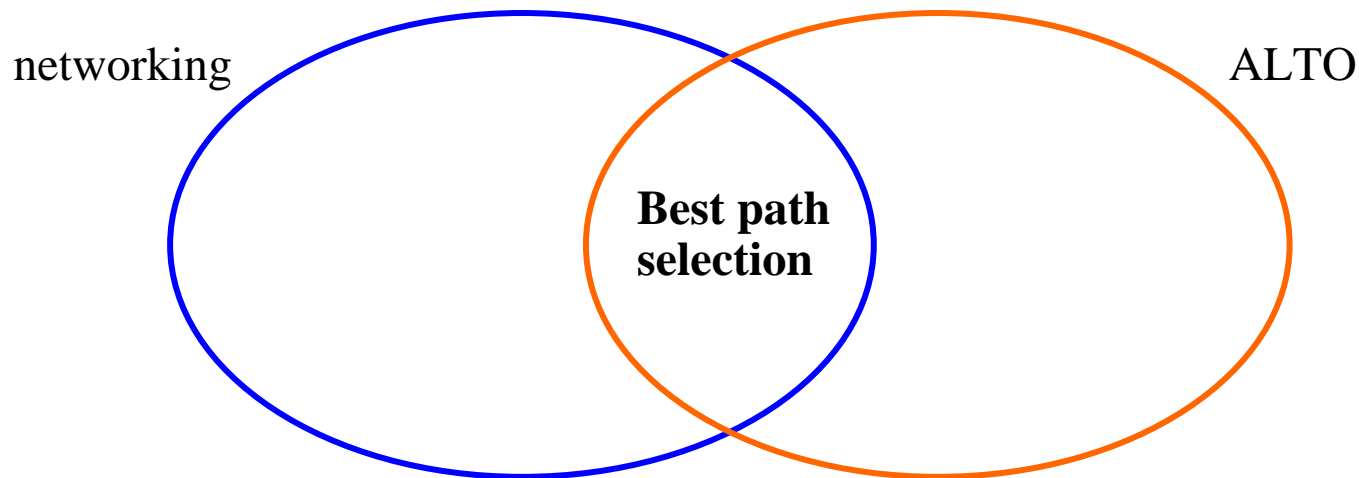

S

ISP5 ISP3 ISP4

ISP2

ISP1

ISP6
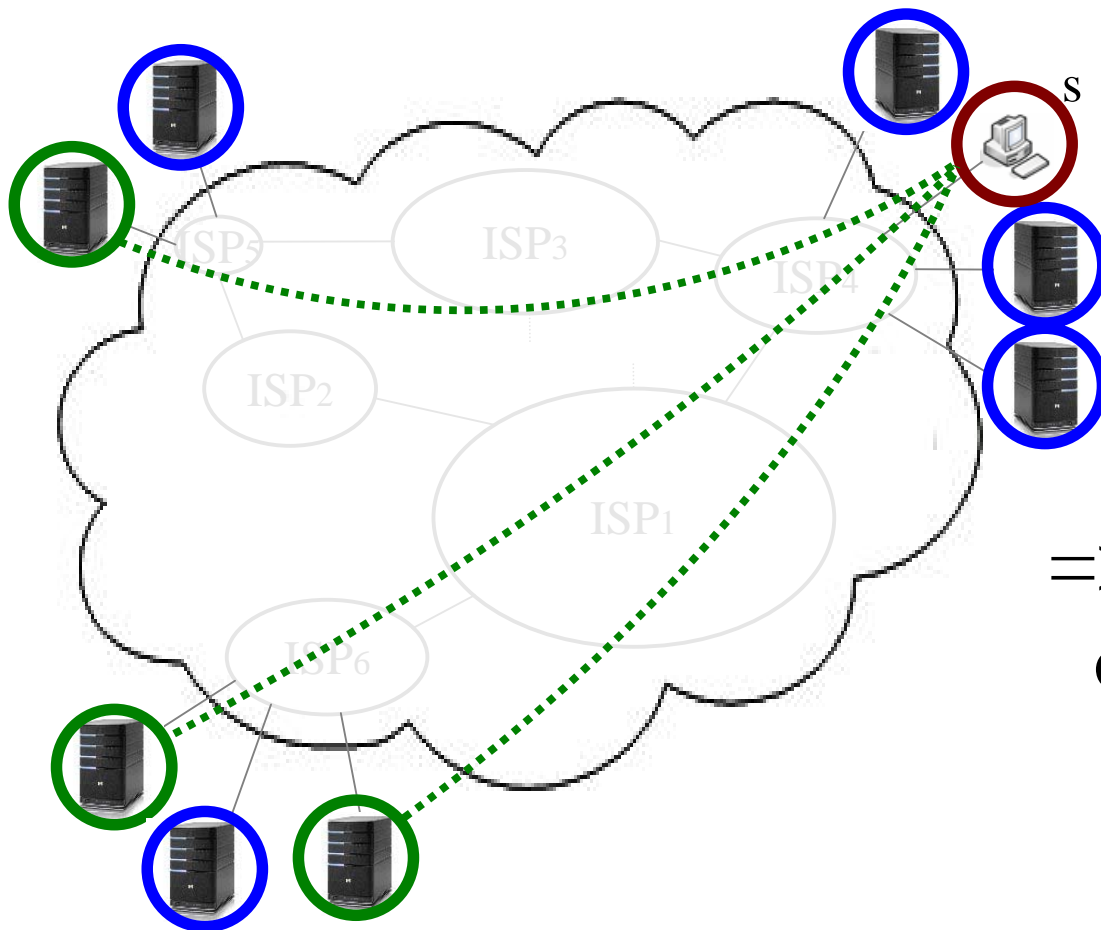
=> a similar problem, but
on a P2P infrastructure

○ Selected peer
○ Possible peer

Conclusion

- IPv4 - IPv6 DS $\in \{<s_{IPv4},d_{IPv4}>, <s_{IPv6},d_{IPv6}>\}$

- MH $\in \{<s_1,d_1>, \dots ,<s_1,d_n>, <s_2,d_1>, \dots , <s_m,d_n>\}$

- Server replication $\subseteq \{<s,d_a>, <s,d_b>, <s,d_c>, <s,d_d>\}$

- P2P Apps $\subseteq \{<s,p_a>, \dots, <s,p_g>\}$

=> General problem $\subseteq \{<s_1,d_1>, \dots ,<s_1,d_n>, <s_2,d_1>, \dots , <s_m,d_n>\}$ for any s,d representation

networking   **Best path selection**   ALTO

ALL share a common problem: how to efficiently make best path selection ?

Next Steps

ALTO approach can be used for this common problem

IF

i) ALTO protocol format/syntax does not restrict ALTO protocol usability and extensibility

ii) ALTO protocol supports different types of "transport addresses" including at least IPv4 and IPv6 addresses

Backup Slides

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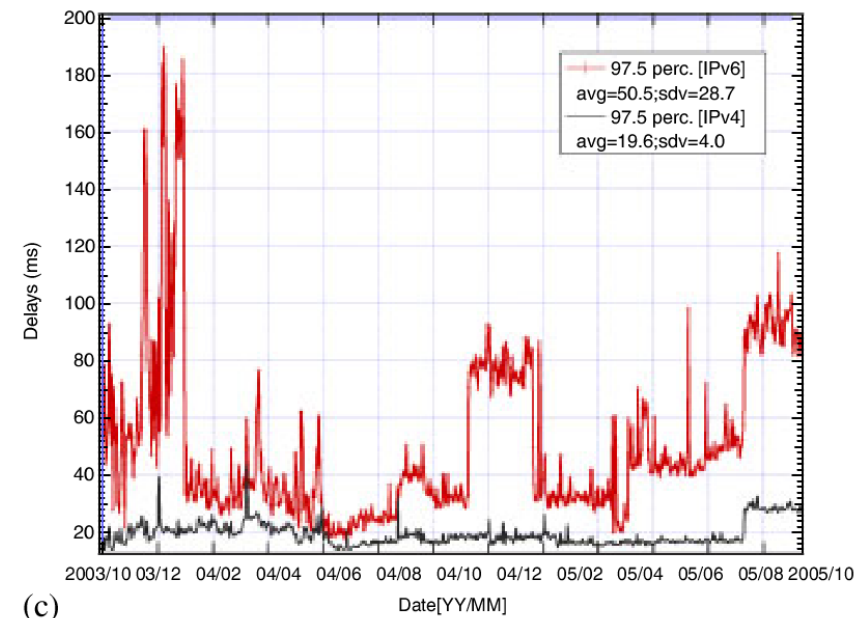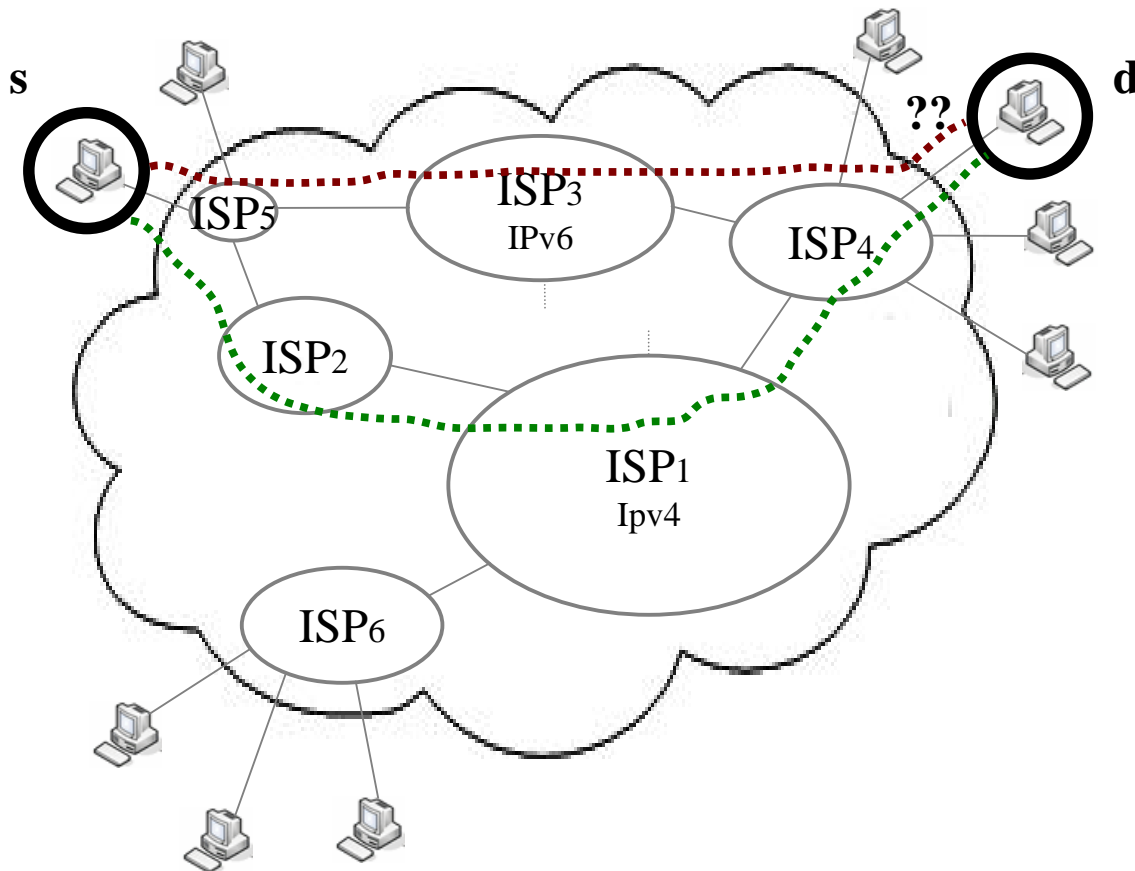
[1] X. Zhou et al., Ipv6 delay and loss performance evolution, IJCS 2008

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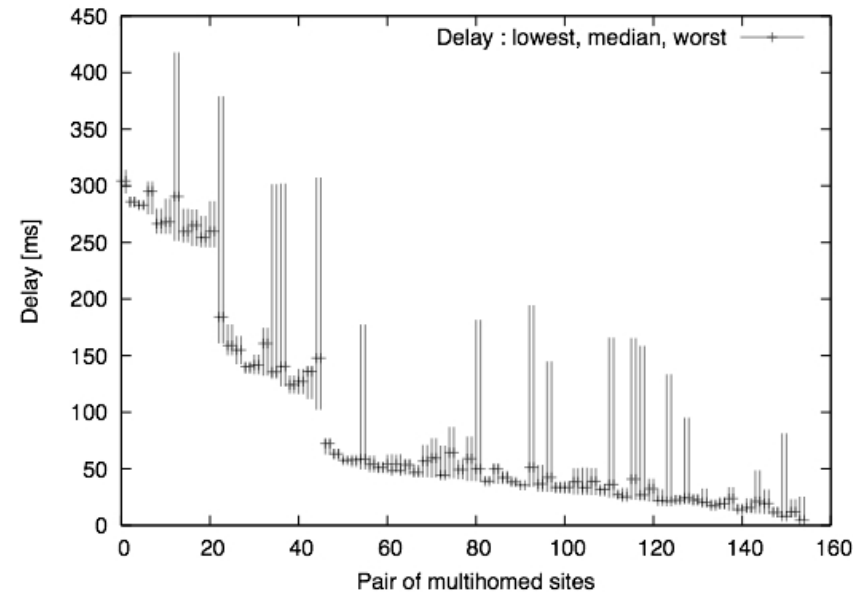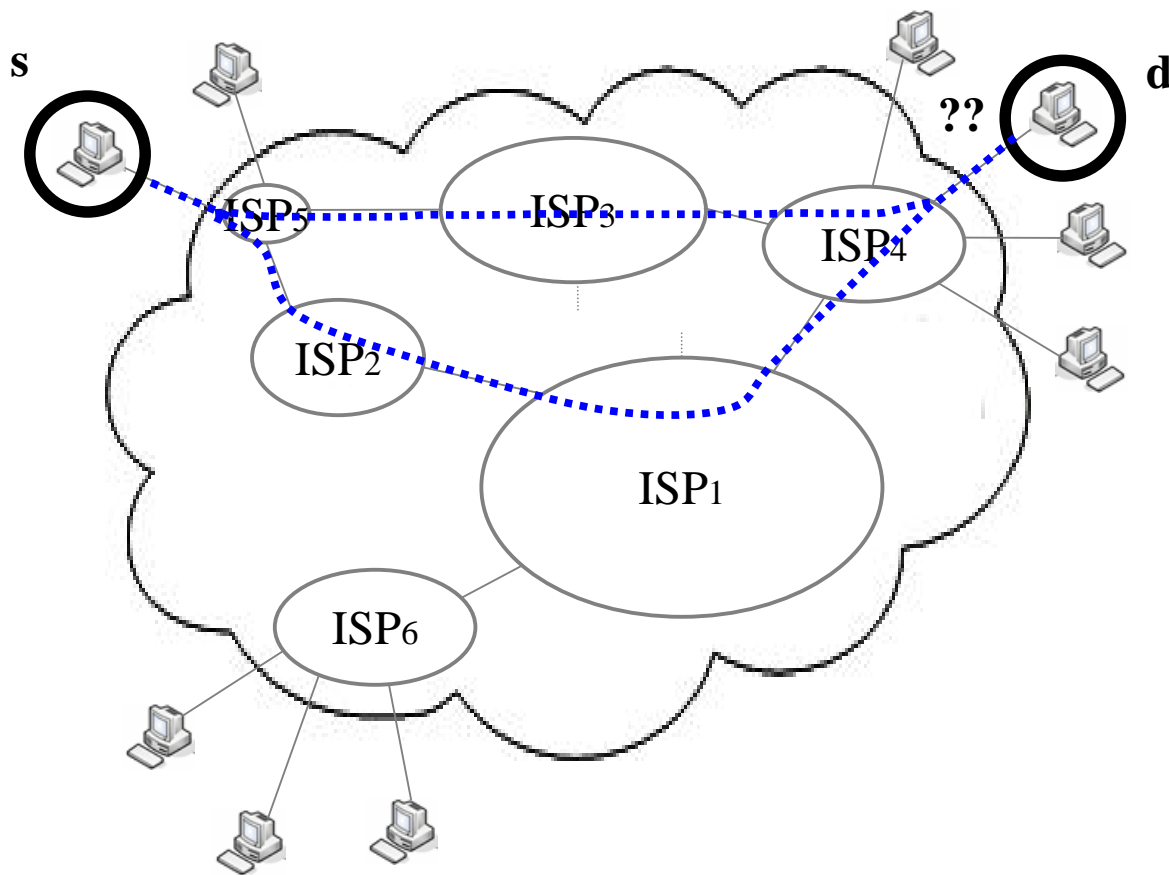
[2] B. Quoitin et al., Evaluating the Benefits of the Locator/Identifier Separation, MobiArch 2007