Similar problems

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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 replica S 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: \( s_1 \)

\[ \Rightarrow \text{determine the best peers among several: } \{<s, p_a>, \ldots, <s, p_g>\} \]

\[ \Rightarrow \text{a similar problem, but on a P2P infrastructure} \]
Conclusion

- IPv4 - IPv6 DS ∈ \{<s_{IPv4},d_{IPv4}>, <s_{IPv6},d_{IPv6}>\}
- MH ∈ \{<s_1,d_1>, … ,<s_1,d_n>, <s_2,d_1>, … , <s_m,d_n>\}
- Server replication ⊆ \{<s,d_a>, <s,d_b>, <s,d_c>, <s,d_d>\}
- P2P Apps ⊆ \{<s,p_a>, … ,<s,p_g>\}

=> General problem ⊆ \{<s_1,d_1>, … ,<s_1,d_n>, <s_2,d_1>, … , <s_m,d_n>\} for any s,d representation

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
**IPv4 vs IPv6 Dual Stack (DS)**

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