

Path Aware Networking Research Group

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What is path-aware networking?

- An internetworking architecture is *path aware* if the network:
 - explicitly exposes information about the paths to the endpoints, and
 - allows endpoints to have control over the paths over which their traffic will be sent.
- The current Internet architecture is not path-aware, but IETF technologies (and others) could be used to build a path-aware Internet.

Why path-aware networking?

- Ability to expand multi-path transport beyond multiply-connected devices.
- Exploration of alternate architectures for routing, and the trustworthiness of routing information.
- Experimentation with cooperative signaling as a question of path properties and path selection.

Open research questions

- How to define and represent the properties of paths?
 - *Path selection properties* are a feature of the proposed TAPS architecture.
- How to give endpoints access to trustworthy information about path properties?
- How to give endpoints control over paths selected for given traffic, in a way the network can trust?
- How can interfaces to the transport and application layers support the use of path awareness?
 - This question is also being partially addressed in TAPS.

More open research questions (slightly more science-fiction)

- How should transport-layer and higher layer protocols be redesigned to work most effectively over a path-aware networking layer?
- How is path awareness (in terms of vocabulary and interfaces) different when applied to tunnel and overlay endpoints?
- How can a path aware network in a path aware internetwork be effectively operated, given control inputs from the network administrator as well as from the endpoints?
- How can the incentives of network operators and end-users be aligned to realize the vision of path aware networking?