
Path Aware Networking Research Group Charter

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Preamble

The Internet architecture assumes a division between the end-to-end functionality of the transport layer and the properties of the path between the endpoints. The path is assumed to be invisible, homogeneous, singular, with dynamics solely determined by the connectivity of the endpoints and the Internet control plane. Endpoints have very little information about the paths over which their traffic is carried, and no control at all beyond the destination address.

Increased diversity in access networks, and ubiquitous mobile connectivity, have made this architecture's assumptions about paths less tenable. Multipath protocols taking advantage of this mobile connectivity begin to show us a way forward, though: if endpoints cannot control the path, at least they can determine the properties of the path by choosing among paths available to them.

This research group aims to support research in bringing Internet path awareness to transport and application layer protocols, and to bring research in this space to the attention of the Internet engineering and protocol design community.

Scope

The scope of work within the RG includes, but is not strictly limited to:

- communication and discovery of information about the properties of a path on local networks and in internetworks, exploration of trust and risk models associated with this information, and algorithms for path selection at endpoints based on this information.
- algorithms for improving the operation of transport-layer protocols using information about local network and end-to-end path properties.
- approaches for reconciling endpoint path selection with widely deployed interdomain routing protocols and network operations best practices.
- exploration of previous attempts to use lower-layer or end-to-end path information at the transport layer, in an effort to understand the limits of applicability and deployability of these approaches.

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outlines these

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what-not-to-do



Interactions

As path-aware networking is an architectural concept, it necessarily draws from research and engineering work on existing technologies at various stages of maturity. Many of these technologies are targeted for intradomain environments; one of PANRG's goals is to expand their applicability to cover interdomain operations, as well.

PANRG will additionally serve as a coordination point among existing IETF and IRTF efforts with which its scope overlaps. These include, but are not limited to:

- groups working on multipath transport protocols in multiply-connected environments (e.g. MPTCP, QUIC, TSVWG)
 - congestion control in multiply-connected environments (e.g. ICCRG)
 - routing architectures and technologies supporting some notion of a path or path properties (e.g. LISP, SPRING)
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Meetings

Meetings are by default open with open attendance and published proceedings, with remote participation and recording as provided by the meeting venue, according to the IRTF's IPR policy. This is always the case with at least one PANRG meeting co-located with an IETF meeting noted above. However, as deemed necessary, the chairs may hold virtual or physical meetings with restricted attendance to discuss observations which cannot be shared openly, provided that some outcome of such a meeting may be openly shared with the community.

PANRG will meet one to three times per year, as deemed necessary by the chairs and according to demand. At least one PANRG meeting will be co-located with an IETF meeting per year. Given the PANRG's charter to bridge the gap between Internet standards and measurement communities, the PANRG may also meet collocated with relevant academic conferences or network operator forums, as appropriate.
