
Path Aware Networking Research Group

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Overview

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PANRG Overview

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 making transport-layer scheduling decisions based on information about path properties.
 - algorithms for reconciling path selection at endpoints with widely deployed routing protocols and network operations best practices.
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Work Items: Current Open Questions in PAN

1. how are path properties defined and represented?
 - a. See [draft-irtf-panrg-path-properties](#)
 2. how do endpoints get access to trustworthy path properties?
 3. how can endpoints select paths to use for traffic in a way that can be trusted by the both the network and the endpoints?
 4. how can interfaces to the transport and application layers support the use of path awareness?
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Open questions (2)

5. how should transport-layer and higher layer protocols be redesigned to work most effectively over a path-aware networking layer?
 6. how is path awareness (in terms of vocabulary and interfaces) different when applied to tunnel and overlay endpoints?
 7. 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?
 8. how can the incentives of network operators and end-users be aligned to realize the vision of path aware networking, and *how can the transition from current ("path-oblivious") to path-aware networking be managed?*
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RFC9049: Obstacles to Deployment (A Bestiary of Roads Not Taken)

- Catalogs historical “obstacles to deployment” for “path-aware” IETF protocols over several decades
 - Informed the development of “open questions” for the research group, as listed on previous slides
 - Does not catalog every “path-aware” IETF protocol, only protocols necessary to explain the obstacles
 - **Key takeaway for ALTO fans** - these obstacles seem to be persistent. Keep your eyes open!
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RFC9049 (2): Key Pointers

- [Summary of Lessons Learned](#)
 - High-level summaries for each lesson
 - With pointers to protocols behind each lesson
 - [Applying the Lessons We've Learned](#)
 - Especially Table 1
 - “Invariant”, “Variable”, “Not Now” categories
 - Some obstacles are immutable, other obstacles might be overcome by engineering analysis, and yet other obstacles are “still research”.
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How PANRG Could Help

From [the ALTO proposed charter](#):



Provide a place to collect implementation deployment and experience.

- *PANRG would love to hear about ALTO deployments. What worked, what did not, why?*

- Perform protocol maintenance for the existing published protocol



Develop operational support tools for the ALTO protocol

- *High-level discussion on operational experience and tools is welcome in PANRG.*
- *YANG might not be so...*

- Support for modern transport protocols.



Future use cases

- *Most definitely in scope for PANRG*
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