

Path Aware Networking: Obstacles to Deployment
(A Bestiary of Roads Not Taken)
(draft-irtf-panrg-what-not-to-do-08)

Spencer Dawkins

Changes since -04 at IETF 106

- [-05](#) incorporated feedback from PANRG at IETF 106
 - Chairs initiated Research Group Last Call on this version in December
- [-06](#) addressed detailed review of -05 from Theresa Enhardt
 - Thanks, Michael Sharf, for helping me clarify MP-TCP text!
- [-07](#) addressed detailed review of -05 from Mohamed Boucadair
 - The mailing list has been quiet since -07 was submitted in January
- [-08](#) fixed a misspelling of Olivier Bonaventure in the first paragraph
 - (Seriously?) Sorry, Olivier!

*So, we COULD be finished ...
... but are we?*

So ... what IS "Path Aware Networking", anyway?

- I got this comment more than a couple of times, especially in Last Call
 - I remember seeing that comment on other PANRG docs
- I added something that may not be completely wrong in -06
 - "Section 1.2 A Note About Path Awareness"
- I have no reason to believe most of the RG even noticed it ...
 - ... and this draft was adopted by the RG, so that's probably not good

*So let's talk about what Path Aware Networking **actually** is!*

Section 1.2 "A Note About Path Awareness"

- "The Internet architecture assumes a division between the end-to-end functionality of the transport layer and the properties of the path elements between the endpoints. For several decades, various communities have proposed technologies for endpoint transport layers that rely on changing the behavior of path elements along paths, or rely on determining the properties of path elements along paths and adjust their own behavior based on that understanding.
- "Examples of both of these strategies are included in this document. More recent proposals have tended toward determining path element behavior and adjusting endpoint behavior."

Section 1.2 A Note About Path Awareness

- "The Internet architecture assumes a division between the control and functionality of the transport layer and the protocol elements between the endpoints. For several decades, various communities have proposed technologies for endpoint control that rely on changing the behavior of path elements along the way. In determining the properties of path elements along the way, endpoints act on their own behavior based on that understanding.
- "Examples of both control and data plane technologies are included in this document. More recent proposals have moved toward determining path element behavior and adjusting endpoint behavior."

STEP AWAY FROM THE MUTE BUTTON!!!
We'll talk about this in a minute ...

From the [draft-irtf-panrg-questions-04](#) Abstract

- "In contrast to the present Internet architecture, a path-aware internetworking architecture has **two important properties**: it **exposes the properties of available Internet paths to endpoints**, and **provides for endpoints and applications to use these properties to select paths** through the Internet for their traffic ..."
- (There's more in [the Introduction](#), but you get the idea)

From draft-irtf-panrg-path-properties-00

- "In the current Internet architecture, hosts generally do not have information about forwarding paths through the network and about services associated with these paths. A path-aware network, **as introduced in [I-D.irtf-panrg-questions]**, exposes information about paths to hosts or to other entities."

"So, what's your point, Spencer?"

- My point is that I'm not sure that we have a canonical definition of PAN
 - If we do have one, is it the definition in [draft-irtf-panrg-questions](#)?
 - ISTHM that definition is more about PAN *architecture* than PAN itself
- Do we need a canonical definition?
 - If "yes", can we discuss a canonical definition on the PANRG mailing list?
- If we can agree on a definition, where should we put it?
 - I'm thinking that draft-irtf-panrg-what-not-to-do is a horrible place for it
 - The Section 5 contributions probably DON'T all share one understanding
 - draft-irtf-panrg-path-properties COULD work
 - Is there a better place?

Please Discuss

Section 1.2 "A Note About Path Awareness"

- "The Internet architecture assumes a division between the end-to-end functionality of the transport layer and the per-hop functionality of the network layer between the endpoints. For several decades, various research communities have proposed technologies for endpoint-to-endpoint path awareness that rely on changing the behavior of path elements along the path. These technologies are in various stages of determining the properties of path elements along the path and how they should behave based on that understanding.
- "Examples of these technologies are included in this document. More recent proposals have been focused toward determining path element behavior and adjusting endpoint behavior."

So, back to
draft-irtf-panrg-what-not-to-do-08

Section 1.2 "A Note About Path Awareness"

- "The Internet architecture assumes a division between the end-to-end functionality of the transport layer and the properties of the path elements between the endpoints. For several decades, various communities have proposed technologies for endpoint transport layers that rely on changing the behavior of path elements along paths, or rely on determining the properties of path elements along paths and adjust their own behavior based on that understanding.
- "Examples of both of these strategies are included in this document. More recent proposals have tended toward determining path element behavior and adjusting endpoint behavior."

Reasons to publish this draft Real Soon Now

- The goals for this *Informational* draft are to *inform*
 - Research **in** this RG
 - Research **outside** this RG
 - **Engineering outside** this RG
- ISTM that we need to publish in order to inform work outside the RG
 - ISTM I see proposals every IETF cycle that need this document ...

*So, are we finished yet?
If not, what else do we need to do?*