Technology Deep Dive: Spherical Routers, Forwarding Plane Realities, and Implications for Protocol Designers (WGTLGO)

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Note Well

This is a reminder of IETF policies in effect on various topics such as patents or code of conduct. It is only meant to point you in the right direction. Exceptions may apply. The IETF's patent policy and the definition of an IETF "contribution" and "participation" are set forth in BCP 79; please read it carefully.

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- As a participant in or attendee to any IETF activity you acknowledge that written, audio, video, and photographic records of meetings may be made public.
- Personal information that you provide to IETF will be handled in accordance with the IETF Privacy Statement.
- As a participant or attendee, you agree to work respectfully with other participants; please contact the ombudsteam (https://www.ietf.org/contact/ombudsteam/) if you have questions or concerns about this.

Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- BCP 9 (Internet Standards Process)
- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
- https://www.ietf.org/privacy-policy/ (Privacy Policy)

I E T F

WGTLGO ("We Got The Last Good One")

- Administrivia - ADs
  - Note Well, Agenda Bash, Scribe Dragooning
  - What do we do at a Technology Deep Dive
- "Spherical Routers"
  - Spencer
- Forwarding Plane Realities + Q&A
  - Frank Brockners, John Scudder, Toerless Eckert
- Summarizing implications for protocol designers
  - **All - this is a working session**
- Next Steps for the summary of implications for this topic
  - Chairs
- Next Steps for Technology Deep Dives on other topics
  - Chairs and AD

WGTLGO Etherpad and Jabber room are in the usual places (see IETF agenda in datatracker for links)

"First, assume a <u>spherical router</u> ...
at <u>zero gravity</u> ...
at <u>zero degrees temperature</u> ..."

"Spherical Cows at the IETF" ...

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How we got here in the first place

- John Scudder gave a well-received talk on Modern Router Design
  - At IEPG ("Internet Engineering Planning Group"), to a small audience, in 2015
- Some people "assume a spherical router" - they exist, but most routers aren't spherical
- Too many working groups encounter contentious cross-area/late IETF Last Call issues
  - Most recently, assumptions about IPv6 extension headers, but there are others
  - These are still **late surprises** for too many working groups
- Spencer and Warren thought a "technology deep dive" would be helpful
  - Not a tutorial - people understand how routers work in general
  - We wanted a cross-area working session on a complex topic
- So we started recruiting people to help with a "Deep Dive on Modern Router Design"
  - That morphed - of course - and here we are now

What We Do At Technology Deep Dives

When to complain about "unstructured time"

| Working Group Chairs prepare to complain	Tuesday Chairs Session
You are here ------------------------------------>	*"WGTLGO Technology Deep Dive"*
Community complains to IESG	Wednesday Plenary Open Mike

Not a tutorial, so what ARE we doing in this session?

Information sharing (ick, corpspeak) on a complex cross-area topic

- Open discussions
- Understanding the world from each others' viewpoints
- Clearing the air

Together, figure out what the implications for protocol designers are

Together, figure out what, if anything we should do as a follow-on
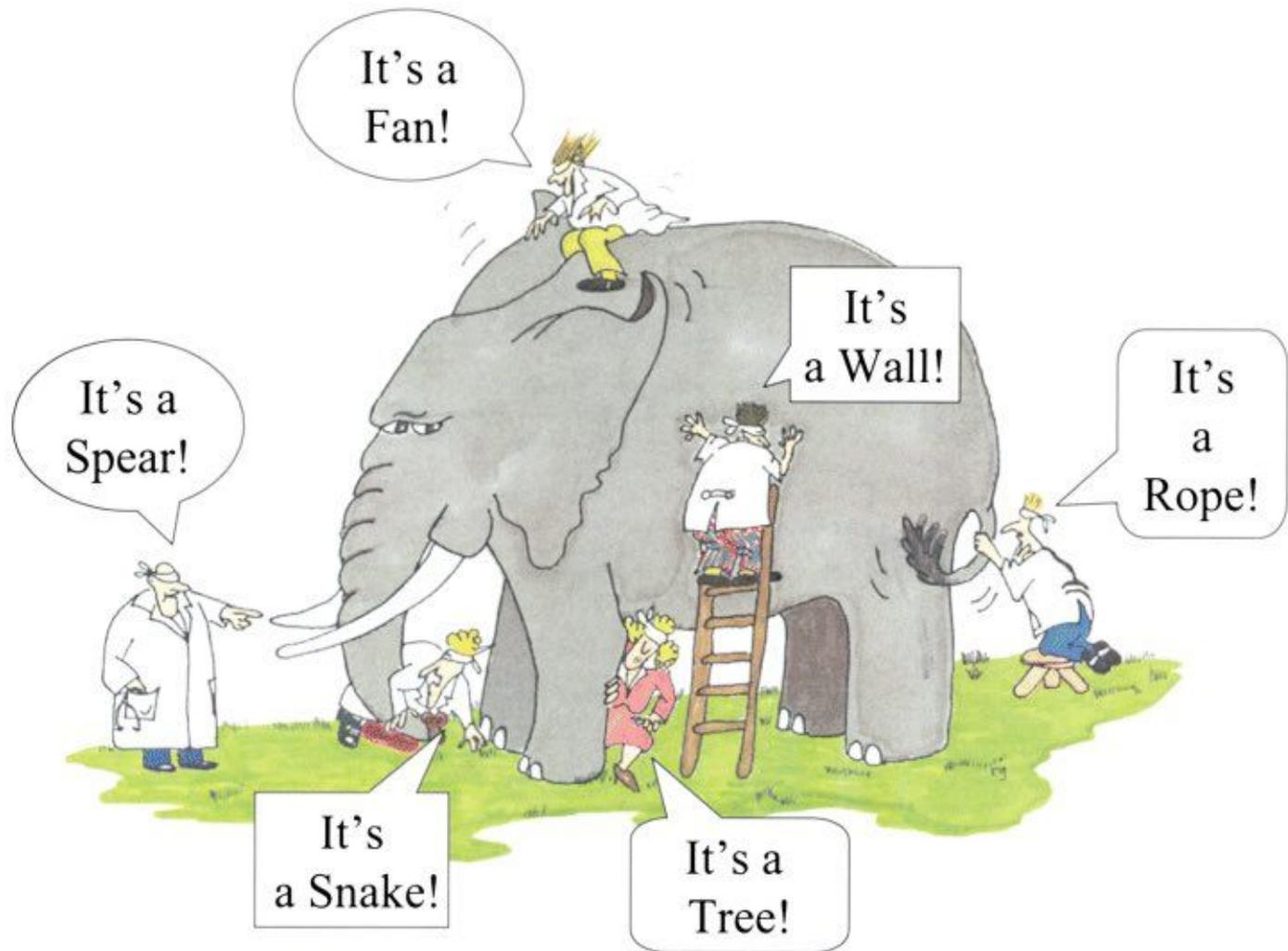
Forwarding Plane Realities

Frank Brockners
John Scudder
Toerless Eckert

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Summarizing implications
for protocol designers

(Please participate on Etherpad Link!)

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Starting points for summarizing implications

From the chairs' informal discussions
- Fragmentation and reassembly in routers
- ICMP-based Path MTU Discovery
- Per-flow state (IntServ)
- Significant use of Router Alerts
- Extension header processing and scanning for ACLs
- Looking into packet payloads
- Looking at packets inside tunnels
- Using multicast trees (can't be aggregated)
- Using very specific routes/long prefix lengths

From Frank/John/Toerless
- Header Size Limits
- Header Spacing
- Respect the Hierarchy
- Use Existing Headers, Tunnels
- Flow Identification
- Check Values
- State on Forwarding Devices

From Bill Fenner: "Anything we did in the 1990s"

Next Steps for
"Summary of Implications"

(Chairs)

We could do lots of things next. Should we ...

- Publish minutes of this session and thank everyone, because we are done?
- Publish informational report from this session?
- Request a mailing list to continue discussion about these implications?
- Charter work on recommendations (BCPs?) from this session?
- Communicate with operator groups to level-set on expectations?

Other suggestions are <u>highly</u> in scope!

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Next Steps for Technology Deep Dives

(*Chairs*)

https://www.surveymonkey.com/r/104techdeepdive

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