

# **Tunnel Foo over UDP discussion**

what recommendations does TSV make (and why)

TSVAREA meeting @ IETF-89

# Where to start from

- A number of tunneling foo-over-UDP proposals
  - (incomplete list – for sure!)
  - [Generic UDP Encapsulation for IP Tunneling](#)
    - draft-ietf-tsvwg-gre-in-udp-encap
  - [Encapsulating MPLS in UDP](#)
    - draft-ietf-mpls-in-udp
  - [Generic UDP Encapsulation](#)
    - draft-herbert-gue
  - [Automatic Multicast Tunneling](#)
    - draft-ietf-mboned-auto-multicast

# WHAT'S THE ISSUE?

# Taking any protocol to run over UDP

## See prior talk about BCP 145

Below transport layer protocols  
tunneled over UDP

Lower-layer protocols 'escape' from  
their environment  
and run over the public Internet

Usually  
no feedback loop  
and  
no reaction to feedback

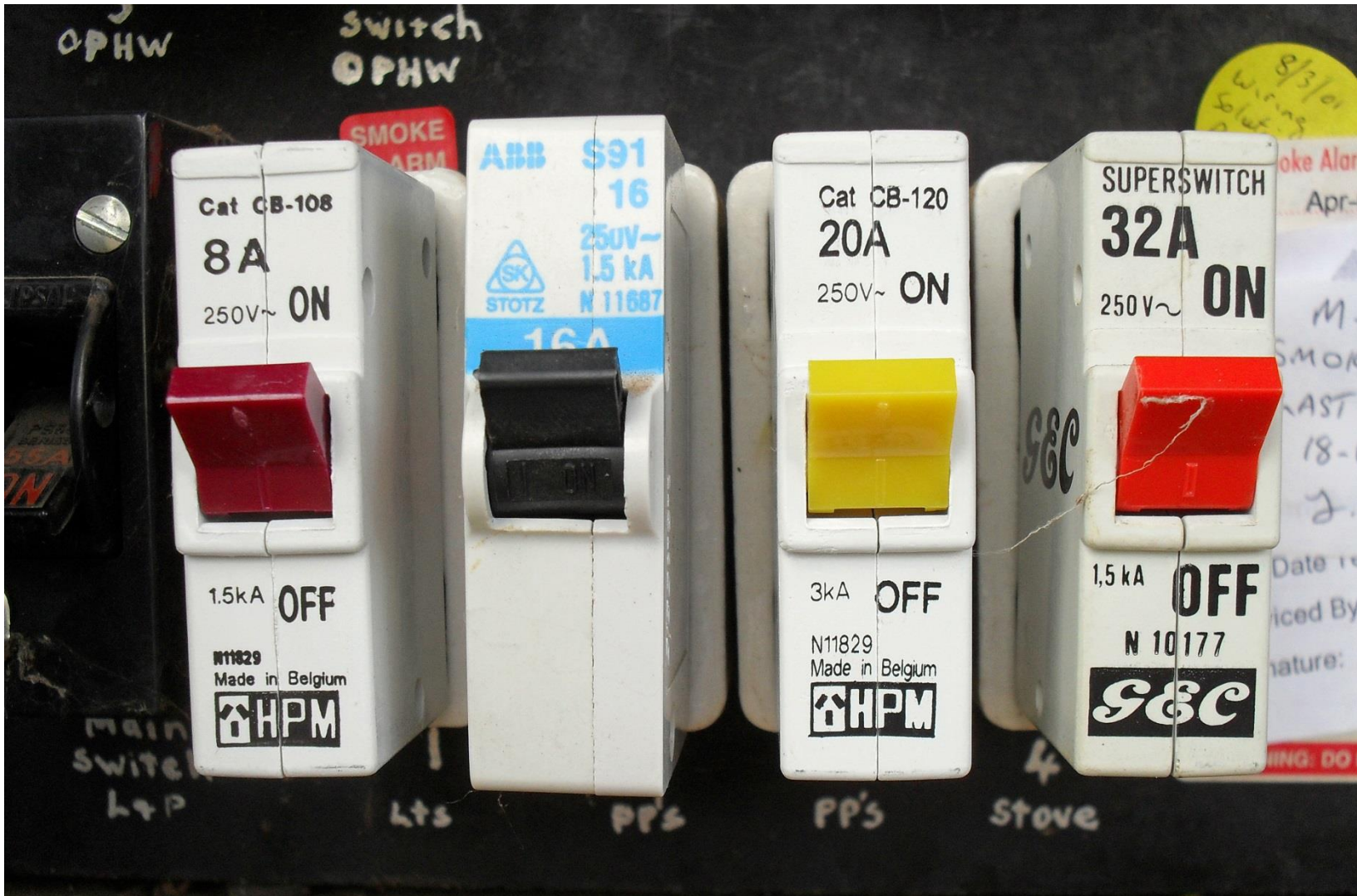
# RECOMMENDATIONS

# What to do, if?!

- Feedback loop is required
- Reaction to feedback loop is required
- Reaction can be
  - Reduction in sending rate
  - Stop service – fire circuit breaker
- Depends on your “application”
  - How long is you “application” working in a useful operating point if there is congestion?



# Circuit Breakers!



# TDM Pseudowires: “Circuit Breaker” Ideas

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# TDM Pseudowires (PWs)

- Emulate fixed-bandwidth TDM (e.g., T1, E3)
- Transmission: ON or OFF (cannot adjust rate)
- TDM PWs known to run over IP
  - What happens when they compete with TCP?
  - Or other congestion-responsive traffic?
- Author team working (slowly) on a draft
  - draft-ietf-pwe3-congcons (expired, sorry)
  - Initial results apply to “circuit breakers”

# Pseudowire (PW) Background

- Pseudowire (PW) emulates a “wire”
  - Ethernet, Frame Relay, TDM telephone, FC, etc.
  - Mostly over MPLS, some over IP
- Significant congestion concerns arose
  - E.g., see RFC 3985 (Sec. 6.5), RFC 4553 (Sec. 8)
- Congestion usually not a problem in practice
  - Most PWs run over traffic-engineered MPLS
  - But some PWs run over IP, e.g., TDM PWs
    - Time Division Multiplex – voice and/or data

# Generalizing

1. Independent service level spec for traffic
  - Crucial input, independent of TCP for TDM PWs.
2. Apply TCP throughput equation
  - Depends on RTT (2-way latency) and loss rate
3. Monitor error rate and define threshold
  - Threshold could be generous (multiple of TCP)
4. Figure out what to do when threshold exceeded
5. More importantly, **\*how/where\*** to do it:
  - Hypothetical TDM PW “delayed trip circuit breaker”:
    - Management plane, human network operator
    - Response delays ok: This is about recovery when prevention fails.
  - Approaches to other technologies will vary.