

# IP Fragmentation Considered Fragile

draft-ietf-intarea-frag-fragile-02

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IETF 103

# What We Seem To Agree On

- The Problem
  - When a packet is fragmented, the upper-layer header appears only in the first fragments
  - Many *stateless* middle boxes require access to the upper-layer header
    - By definition, a stateless middle box does not perform virtual reassembly of fragmented packets
  - IP fragmentation causes these stateless middle boxes to behave badly
- The Recommendation
  - Applications SHOULD break their reliance on IP fragmentation
    - Push the problem of fragmentation to upper-layers
  - Middle box developers SHOULD make their devices stateful enough to work well in the presence of IP Fragmentation

# Outstanding Issues

- Should IPERF be included in Section 6
  - Applications That Rely on IP Fragmentation
- Others?

# Merciless Reality Check

- Will application developers heed the recommendations?
  - Cost of compliance for new applications is relatively low
  - Legacy applications will break their reliance on IP fragmentation when they are economically motivated to do so
    - Maybe DNS will be among the first
- Will middle box developers heed the recommendations?
  - Cost of compliance varies with middle box type
  - Middle box vendors will produce devices that behave well in the presence of IP fragmentation when they are economically motivated to do so
    - Probably requires motivation beyond that which exists today
  - Problem of the installed base
- The market will decide!!

# Next Steps

- One final update, reflecting outcome of today's conversation
- Working Group Last Call