Operational Guidance for Deployment of L4S in the Internet

draft-white-tsvwg-l4sops-02

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Scope

• Specific to the issue of L4S/Classic coexistence in RFC3168 bottleneck links (single queue bottlenecks & VPNs in fq)
  • Provide guidance to operators of L4S hosts
  • Provide guidance to operators of networks
  • Provide recommendations to researchers

• Not just in-band detection and fallback
  • Experiments to identify RFC3168 instances
  • Pre-deployment measurements
  • In-band monitoring + administrative fallback
  • Mitigations for network operators

• Note: General requirements, definition of the L4S experiments, and other operational guidance for L4S are in the L4S drafts
  • ECN-L4S-ID draft requires hosts to be capable of disabling L4S functionality by application and/or administrative control
Status

• Individual Draft
  • Draft-00 (July 2020) discussed @IETF108
  • Draft-01 (Nov 2020) discussed @IETF109
  • Draft-02 (Feb 2021)
    • Addressed comments:
      • Discuss VPNs + fq_codel
      • Include discussion on fairness
    • Improvements in Introduction
    • Section dedicated to detection mechanisms (currently a pointer)
    • Discussion of general-purpose servers vs. specialized servers
Summary of Draft-02

• Discusses prevalence & severity
  • L4S coexists well with classic traffic aside from shared RFC3168 queues
    • Single queue RFC3168 bottlenecks – believed to be rare
    • VPN traffic in fq_* bottlenecks – less rare
  • Mainly an issue for long-running flows at high data rates with long RTTs
  • Can result in L4S flows outcompeting classic flows
  • Summarizes historical issues around per-flow fairness

• Discusses detection of RFC3168 bottlenecks via experiments
  • Detecting FIFO vs. FQ is of interest
  • Points to methods for detecting RFC3168 in “Fallback” report¹
  • Does not recommend L4S network nodes uniformly disable RFC3168 ECN (Alex Burr’s idea)
    • See Bob Briscoe’s slides: https://bobbriscoe.net/presents/2103ietf/l4s-exclusive-ecn-marking.pdf

• Provides guidance for operators of L4S hosts
  • Prior to deployment, conduct experiments on presence of RFC3168 bottlenecks
  • Take action if warranted, guidance depends on context:
    • General purpose servers (e.g. web) vs. Specialized servers (e.g. cloud gaming)
    • Edge servers vs. other hosts

• Provides guidance for operators of RFC3168 bottlenecks
  • Several options outlined to eliminate any coexistence issues

Mailing List Comments (since draft-02)

• Include more references to data about the deployment of RFC3168
  • And interpretations, e.g. fq vs fifo
• More info on ways to cache/maintain a list of detected 3168 paths
• Discussion of risk of incorrectly classifying a path
• “Disable RFC3168 ECN Marking” section needs to be written more clearly
• Cite RFC7567?
• Mention that RFC3168 FIFOs aren’t prohibited, so could be deployed in the future
  • Non-ECN FIFO AQMs *do* exist, some of these could turn on ECN support
• Discuss Risks
  • Risk = Severity * Likelihood
  • Who suffers? (active participant vs. innocent bystander)
WG Adoption?

- Adoption call announced March 9
- Concludes March 24