High Frequency Chaos Engineering

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In-band telemetry

- http://opennetsummit.org/wp-content/themes/ONS/files/sosr-demos/sosr-demos15-final17.pdf

- See what every packet is doing, to the nanosecond: https://barefootnetworks.com/products/brief-deep-insight/
- Programmable data planes allow additional information to prepended or appended to packets as they pass through the network
- Invisible to applications, containers, VMs
- Allows low overhead measurement of everything that happens on the network

High Frequency Chaos Engineering

- Theoretical performance (limited by cost)
  - Network: 100 Gb/s per port means ~200 Pb/s bisection bandwidth
  - Storage baseline: 75 GB/s, 7 microseconds added latency, 15 million IOPS http://www.newisys.com/products/nss22482f/
  - That makes it possible to launch 6-7 million VMs per second
  - Optimizing for size will put that above the 10 million per second mark
- Since everything is Software
  - Distributed Tracing
  - Software Diversity Testing
  - Moving Target Defence
  - Function as a Service applied to VMs, Containers and applications means substantially smaller security footprint. System wide garbage collect is an added bonus
  - Use CRIU (Checkpoint and Restore In Userspace) to 'freeze' applications in a known state, ready to execute a lot faster that starting from scratch https://criu.org/Usage_scenarios