BBR Updates:

Internal Deployment, Code, Draft Plans

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https://groups.google.com/d/forum/bbr-dev

Google

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Outline

- BBRv2 deployment status at Google: nearing completion for internal TCP traffic
- BBRv2 alpha open source release updates
- BBRv2 Internet Draft plans
- BBR.Swift status

Target for this talk:

- Sharing our experience with experiments
- Inviting the community share feedback, test results, issues, patches, or ideas

Update on BBR v2 deployment status at Google

- Google-internal traffic:
    - BBRv2 being deployed as default TCP congestion control for internal Google traffic
    - Used as the congestion control for **>98%** of internal TCP traffic at Google
        - Currently using bandwidth * min_rtt, ECN, loss as signals
        - Seeing reductions in tail latency for RPC traffic
- Google-external traffic: YouTube, google.com: deployed for a small percentage of users
    - Reduced queuing delays: RTTs lower than BBR v1 and CUBIC
    - Reduced packet loss: loss rates closer to CUBIC than BBR v1
- Continuing to iterate using production experiments and lab tests

Status of BBR v2 algorithm and code

- TCP BBRv2 "alpha/preview" release:
  - Linux TCP (dual GPLv2/BSD): **github.com/google/bbr/blob/v2alpha/README.md**
  - Recent updates:
    - Rebased to Linux v5.10
    - Various minor bug fixes
- QUIC BBR v2 "alpha/preview" release:
  - Chromium QUIC (BSD):on chromium.org in bbr2_sender.{ cc, h }
- BBR v2 alpha release is ready for research experiments; we invite:
    - Ideas for test cases and metrics to evaluate
    - Test results and traces
    - Algorithm/code ideas
    - Patches
- BBR v2 algorithm: IETF 104 [slides | video]; alpha code: IETF 105 [slides | video]

BBR v2: Internet Draft plans

- Current BBR Internet Drafts cover BBRv1:
  - Delivery rate estimation: draft-cheng-iccrg-delivery-rate-estimation
  - BBRv1 congestion control: draft-cardwell-iccrg-bbr-congestion-control
- Planning on updating drafts to reflect BBRv2 for July IETF

BBR.Swift: Status and Plans

- BBR.Swift
  - Leverages approaches from Swift [SIGCOMM-2020]
  - Uses Network_RTT as primary congestion signal
  - Motivation: Provides richer information about the current degree of queuing
    - Allows faster reaction to long queues
    - Avoids overreaction and underutilization with short queues
- Status: Preparing for production testing of BBR.Swift for Google internal traffic
- Plan: deploy, release BBR.Swift code as open source, document the algorithm in detail
  - Including implementation of draft-yang-tcpm-ets-00
- Goal: we want transports to be able to use BBR.Swift as their CC
  - On connections where...
    - Target Network_RTT is known
    - It is known that other traffic sharing bottlenecks is using Swift or BBR.Swift
  - On physical machines or virtual machines

Conclusion

- Actively working on BBR v2, BBR.Swift at Google
    - Finishing roll-out for internal TCP traffic
    - Tuning performance to enable roll-out for external Google traffic
    - Improving the algorithm to scale to larger numbers of flows
    - Planning on BBRv2 Internet Drafts for July IETF
    - We invite the community share test results, issues, patches, or ideas

Q & A

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Internet Drafts, paper, code, mailing list, talks, etc.