Faster Restart for TCP Friendly Rate Control (TFRC)

draft-ietf-dccp-tfrc-faster-restart-05.txt

E. Kohler, S. Floyd, and A. Sathiaseelan

March 2008,

DCCP Working Group
Faster Restart for TFRC:

- After an idle period of at least NFT (no feedback):
  - The allowed sending rate is not reduced below *twice* the initial sending rate;
  - Quadruple sending rate each RTT up to old rate (decayed over time);
There have been no changes since last IETF!

- There will be a report on new simulation results before the next IETF.
Old slides:
Changes from
draft-ietf-dccp-tfrc-faster-restart-03.txt:

• Removed Section 4.1 on receive rate, after it is made into an Errata for RFC 4342. Feedback from Gerrit Renker.

• Additional reporting on simulations.

• Added a section on Interoperability Issues.

• Specified CCID 3 and 4 impact in the introduction.

• Nits from Gorry Fairhurst and Arjuna.

• Changed targeted decay time to configurable DelayTime. Feedback from Gerrit Renker.
Performance after long idle periods:

• **RFC 3448:**
  – Allowed sending rate is halved when NoFeedback Timer expires, down towards initial sending rate.
  – First feedback packet after idle period reports receive rate of one packet per RTT.
    • Allowed sending rate is at most twice receive rate.

• **RFC3448bis after a long idle period:**
  – First feedback packet after idle period reports receive rate of one packet per RTT.
    • Receive rate is NOT based only on this feedback packet.

• **RFC3448bis with Faster Restart:**
  – Allowed sending rate is halved when NFT expires, down towards **twice** initial sending rate.
  – Then each RTT quadruple allowed sending rate towards \(X_{\text{fast\_max}}\).
    \(X_{\text{fast\_max}}\): interpolated highest receive rate since last loss)
Performance in long data-limited periods:

- **RFC 3448:**
  - Allowed sending rate is at most twice: receive rate.

- **RFC3448bis:**
  - Allowed sending rate is at most twice:
    max (recent receive rate,
    receive rate before data-limited period).

- **RFC3448bis with Faster Restart:**
  - Allowed sending rate is at most:
    max (value from RFC3448bis,
    X_fast_max).

  (X_fast_max: interpolated highest receive rate since last loss)
Faster Restart Interoperability Issues with RFC 3448:

• Faster Restart:
  – a sender-only change.
  – built upon RFC3448bis (not RFC 3448).

• How does Faster Restart interact with a receiver using RFC 3448?
  – Performance is NOT higher than with a receiver using RFC3448bis.
  – *No backwards interoperability issue.*
RFC 4342 Errata:

• Section 6 says:
  – 2. A Receive Rate option, defined in Section 8.3, specifying the rate at which data was received since the last DCCP-Ack was sent.

• It should say:
  – 2. A Receive Rate option, defined in Section 8.3, specifying the rate at which data was received over the last round-trip time.

• Makes CCID-3 consistent with RFC 3448 and RFC3448bis.
Faster Restart Interoperability Issues in DCCP’s CCID 3:

- Faster Restart builds on RFC3348bis, not RFC 3448.

- **New CCID-3:**
  - CCID-3 with Faster Restart and RFC 4342 Errata.

- **Old CCID-3:**
  - CCID-3 without Faster Restart and RFC 4342 Errata.

- **New CCID-3 improves performance** after idle and data-limited periods.

- Performance with a new CCID-3 sender and an old CCID-3 receiver is similar to performance with new CCID-3 for both end-nodes.
  - Partial-deployment is NOT an problem.
Future simulations:

• **Can Faster Restart negatively impact others?**
  – Simulation work to consider reverse traffic.
  – Simulations for wireless.
  – Experiments to assess incentive for padding.

• Simulations will focus on **packet drop rates during the Faster Restart period.**

• **Assess if it is safe for use in Internet.**
  – If not, what needs to be evaluated?
End Date?

• Some simulations already done.
  – More are planned for January 2008.

• Expect to have answers for next IETF.
  – Also depends on maturity of RFC3448bis.