Faster Restart for TCP Friendly Rate Control (TFRC)

draft-ietf-dccp-tfrc-faster-restart-00.txt
Slides: http://www.icir.org/floyd/talks/

Eddie Kohler, Sally Floyd
IETF, August 2005

(Faster Restart used to be in:
draft-ietf-dccp-tfrc-voip.)
The Goal of Faster Restart:

- **Current response to idle periods conservative:**
  - Cut allowed rate in half every four idle RTTs.
  - Then slow-start.

- **Safe for network, bad for some applications:**
  - Voice traffic with silence suppression.
  - Slow-start glitches every time new person talks?

- **Faster Restart insight: Path already validated.**
  - More aggressive response than slow start OK after short idle periods.
Initial Design:

- **Remember sustained rate** \( (X_{\text{active_recv}}) \) recently supported by path.
- **After an idle period, "faster-start" up to** \( X_{\text{active_recv}} \).
  - Quadruple rate every RTT up to \( X_{\text{active_recv}} \)
  - If slow start took \( n \) RTTs to recover \( X_{\text{active_recv}} \), this takes \( n/2 \) RTTs
- **For long idle periods (\( \geq 30 \) minutes), no faster restart;**
  - for medium idle periods (10-30 minutes), faster restart to a fraction of \( X_{\text{active_recv}} \)
Problems (from Sara Landstrom)

- What about extremely short idle periods?
- What about application-limited traffic?
  (Immediately before idle period, was sending slower than application allowed)
- What about faster-restarting from an application-limited, but non-idle, state?
Changes to Faster Restart:

- Remember high sustained rate (X_active_recv) recently supported by path:
  - Move X_active_recv up on higher sustained rates.
  - Move X_active_recv down on congestion feedback.
  - Reduce effective X_active_recv as information becomes stale.

- Always allow faster-restart up to X_active_recv.
Comments from:
draft-burness-dccp-interactive-apps-00.txt:

• “In [6] fast restart is allowed inside 10 minutes at the prior rate, reducing to the normal 4 packets minimum by 30 minutes. **We consider this time is too long for two reasons.**”
  – Mobility.
  – Video, or audio on low capacity links.

• **“We propose a similar solution, but with a different timescale.”**