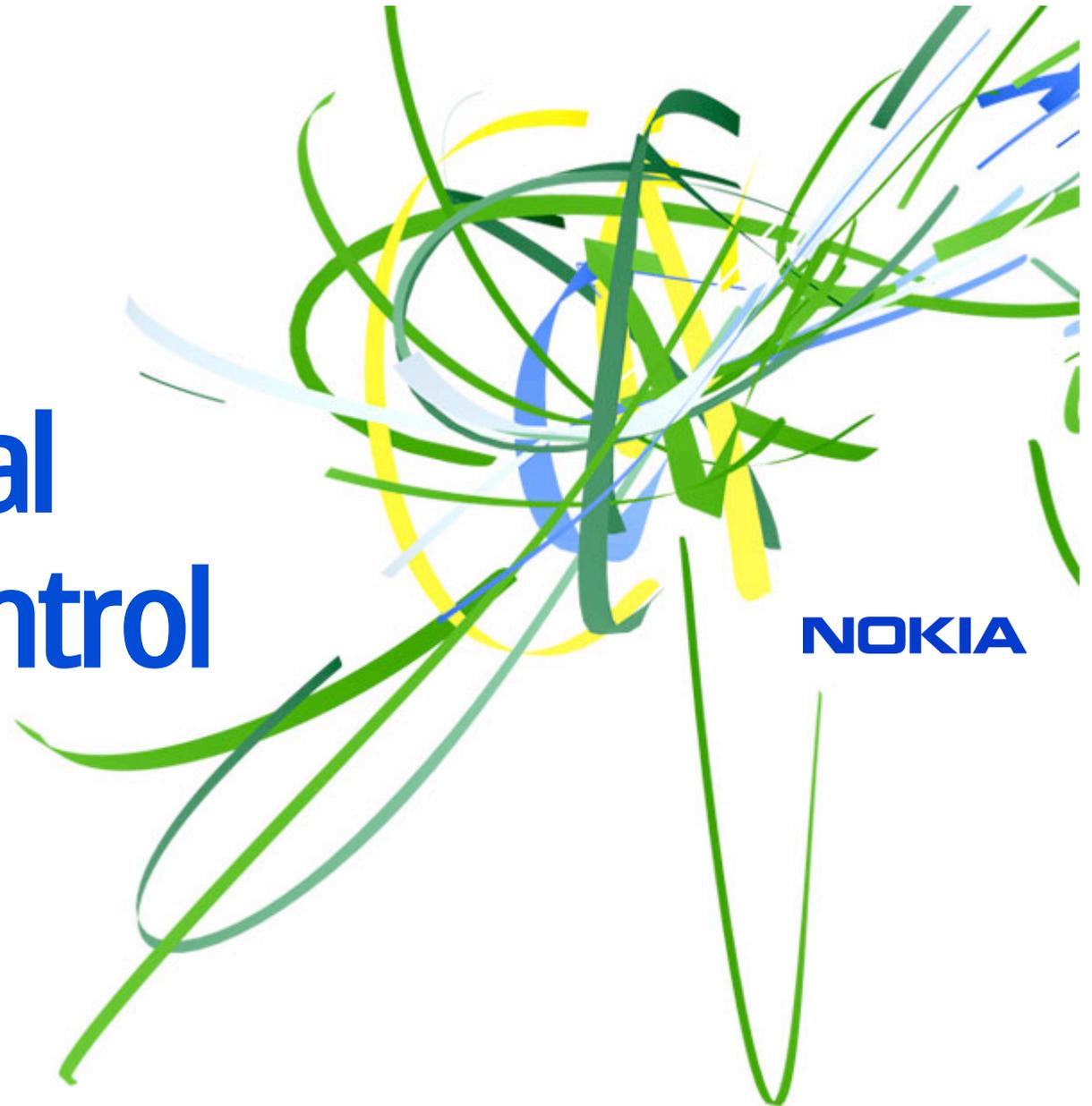


# Towards Deployment of Experimental Congestion Control

Lars Eggert

PFLDnet 2007

2007-2-7



# Where are we?

- lots and lots of promising congestion control research
  - for fat paths, but also other scenarios
  - some schemes useful on an Internet-wide scale
- potential for benefit is usually demonstrated
  - papers, etc.
- potential for bad interactions is less well investigated
  - because it's hard & boring :-)
- metrics & scenarios for comparing schemes are unclear
  - which TCP variant is “the best” and what does that mean?

# Where do we want to go?

- we'd all like to evolve TCP forward
  - TCP = Internet-wide congestion control **standard**
  - **safe** in all environments, performs OK in many
- standard  $\approx$  agreed-upon social contract for CC
  - "how we all use the shared resource we communicate over"
- safe  $\approx$  prevents congestion collapse, some fairness
- a "new TCP" **needs to be a safe standard**
  - not safe  $\rightarrow$  Internet melts down
  - not standard  $\rightarrow$  interactions between different CC (safe?)  
potential for arms race  
hard enough to get one variant right

# Why is there an issue?

- interest to enable new CC features in major stacks exists
- some new CC has already leaked out onto the Internet
  - some stacks move beyond RFC mechanisms
- **we don't know what is safe**
  - optimistic view: "well, the Internet hasn't melted yet"
  - pessimistic view: "but we don't know if it will stay this way"
- **we might want to proceed with caution here**
  - CC being one one of the cornerstones of the Internet

# Questions

- what is “safe” for global deployment?
  - metrics, scenarios, behavior?
  - global  $\neq$  fat wired paths - there are crazy links out there
  - if “safe” includes “fair”, what is fair?
- a single standard vs. many different mechanisms?
  - evolve a single standard forward?
  - or: everything that backs off under congestion is OK?
  - something in between? what are the requirements?
- how & what to move from research to standardization?
  - there is IETF interest in an initial effort for Informational/Experimental purposes
- (your question here)

# The panelists

- **Ted Faber**, USC/ISI
  - IETF TCCP WG co-chair
- **Murari Sridharan**, Microsoft
  - C-TCP and Windows TCP/IP Networking
- **Injong Rhee**, NCSU
  - BIC/CUBIC TCP
- **Stephen Hemminger**, Linux Foundation
  - Linux TCP
- **Bob Briscoe**, BT
  - flow-rate fairness: dismantling a religion