802.1Qau: Simulation Ad Hoc Report

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Manoj Wadekar

Intel Corp.

CN-SIM Ad-Hoc: Overview

- Meetings:
  - 9 Weekly (2 hour) meetings held since March 2007 IEEE 802.1 Plenary meeting
- Participation:
  - 18+ members actively participated in the calls
  - Representing 10+ companies
- Goal:
  - Discuss simulations of various proposals for “Required Benchmarks”
    - ECM, E2CM, FECN, QCN

Thank you all for great team work!

Status

- Simulations/results were discussed for following proposals:
  - ECM and FECN comparison: Davide Bergamasco (Cisco)
  - ECM and E2CM comparison: Mitch Gusat/Cyriel Minkenberg (IBM)
  - FECN simulations update: Bruce Kwan (Broadcom)
  - QCN Proposal: Prof. Balaji Prabhakar (Stanford)/Rong Pan (Cisco)
- Additional Workload/Metric discussed and simulated:
  - Pareto distribution for traffic in benchmark #1: Single Hop OG
  - Flow Completion Time (Primarily with no-drop scenarios)
- Pseudocode published for all of the following proposals:
  - ECM (mailto:davide@cisco.com)
  - E2CM (mailto:mig@zurich.ibm.com)
  - FECN (mailto:jain@cse.wustl.edu)
  - QCN (mailto:ropan@cisco.com)

All the presentations

- http://www.ieee802.org/1/files/public/docs2007/au-sim-bergamasco-single-hop-output-generated-070405.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-bergamasco-single-hop-output-generated-070412.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-ZRL-E2CM-bursty-and-hiHSD-r1.1%20.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-ZRL-E2CM-bursty-hiHSD-BCN0-r1.1.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-ZRL-E2CM-src-based-r1.1a.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-ZRL-smallmem-r1%201.pdf
- http://www.ieee802.org/1/files/public/docs2007/au-sim-kwan-ding-revised-prelim-fecn-20070329.pdf
- http://www.ieee802.org/1/files/public/contrib/au-prabhakar-qcn-description.pdf

General Takeaways

- Better understanding of comparison between ECM and E2CM
  - Baseline ECM and E2CM show robust performance even with reduced memory
  - Performance is comparable; “probing” in E2CM may provide better fairness, improved response time
- Discussion on signaling mechanism (at various points)
  - Backward signaling helps reduction of packet drops (avoid overshoot)
  - Forward signaling helps in reclaiming throughput (avoid undershoot)
- More work needed still on:
  - TCP workload
- Work on proposals:
  - No new material on FECN (Except for ECM comparison by Davide Bergamasco)
  - Basic simulations on QCN (More work on baseline topology/workload)

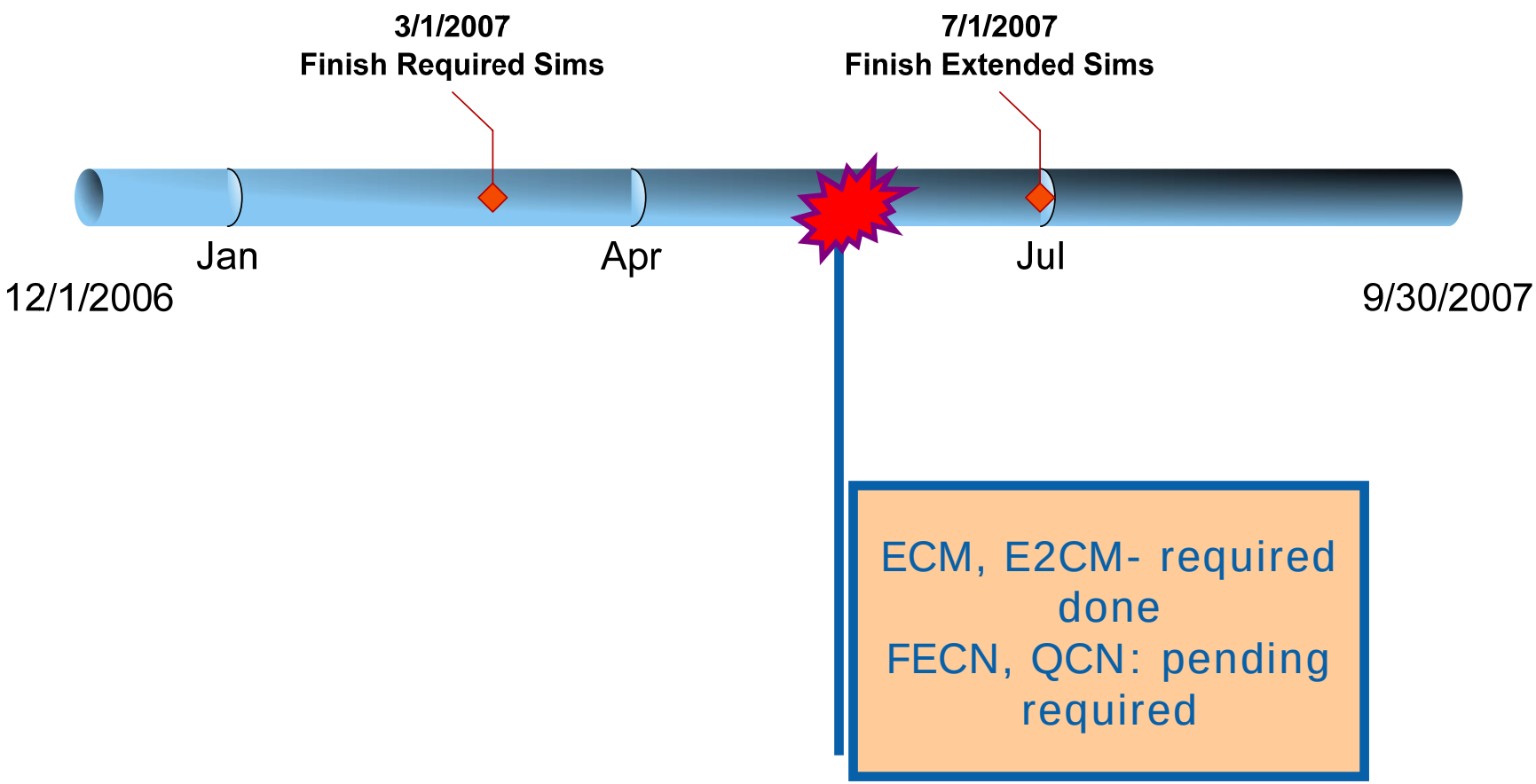
Where are we?

- Protocol Specification:
  - ECM, E2CM, FECN and QCN Pseudo codes are released
  - No new spec changes (for the contending proposals) expected (except when we start hashing out details for selected mechanism in the draft)
- Simulation data:
  - In general more data required for TCP workload and FCT analysis
  - ECM and E2CM seem to have reasonable amount of data for defined “required benchmarks”
  - More work is required for FECN and QCN
- Need enhancement to workload and metric
  - Need to add TCP workload
  - Need to define and add FCT metric

Decision is required

- We have fairly good understanding of proposed algorithms and signaling mechanisms
- We are no way near completing “required and extended” benchmarks
- We need to make decision on:
  - Algorithm for the CN project
  - Signaling mechanism(s) for the project
- This will allow us to focus on getting simulation effort narrowed to the selected mechanism

Timeline


3/1/2007
Finish Required Sims
7/1/2007
Finish Extended Sims
Jan
Apr
Jul
12/1/2006
9/30/2007
ECM, E2CM- required done
FECN, QCN: pending required

Proposed Next Steps

- Select CN mechanism for the Task Force
- Define TCP workload benchmark
- Finish “Required”, TCP benchmark for Selected Mechanism to feed into Draft 0.2
- Continue working on “Extended” benchmarks, TCP benchmark for Selected Mechanism