IEEE Next-Gen Ethernet News

Mike Hughes <mike@linx.net>

UKNOF6

What is the HSSG?

- Stands for “Higher Speed Study Group”
- Study groups convene whenever there is a need do define the project(s) for a future IEEE task force to work on
- In this case, the project(s) will be one or more standards for next-generation Ethernet
- HSSG convened in July 2006 802.3 plenary
  - Industry Ad-hoc prepared a CFI, vote at meeting
  - Voting members: Yes 53, No 3, Abstain 3

IEEE Standards Process

Call For Interest	By a member of 802.3
Study Group	Open Participation, ongoing, meeting this week
Task Force	Open Participation, expected to start Nov 2007
Working Group Ballot	Members of 802.3
Sponsor Ballot	Public Ballot Group
Standards Board Approval	RevCom & Standards Board
Publication	IEEE Staff & project leaders

HSSG Objectives

- Define PAR (Project Authorisation Request)
- 5 Criteria to support the PAR
  - Broad Market Potential
  - Compatibility with 802.3 standard
  - Distinct Identity
  - Technical Feasibility
  - Economic Feasibility
- Project objectives
  - e.g. multiple standards, different media interfaces

HSSG Focus

- MAC Data Rate Discussion
  - 40, 80, 100, 120, 160 Gbit/sec or scaleable?
  - Faster serial speeds
  - Aggregation (multi-lane) solutions
    - Multiple wavelengths (on a single fibre pair)
    - Multiple fibres (multi-channel phy & ribbon cable)
    - Could reuse existing 10GE components this way
- PHY types and reach
  - Copper/Fibre? 500m/10km?
- Reach and Optical Ad-hocs to support these

Objectives Defined

- IEEE 802 Plenary meeting, Dallas, 13-16th November 2006, defined:
  - Full duplex operation only
  - Preserve 802.3/Ethernet frame format at the MAC client service interface
  - Preserve min/max frame sizes as the current 802.3 standard
  - Support a MAC/PLS speed of 100Gb/sec
  - Support at least 10km on SMF (G.652)
  - Support at least 100m on OM3 (laser optimised) MMF

HSSG is meeting this week

- Monterey, California
- Various topics under discussion:
  - Currently trying to add a 40km reach on SMF
  - Discussion of various optical deployments
  - Acceptable BER (issues with BER addition)
  - Economics and market drivers
  - Ongoing input from the user community too
- Most importantly:
  - 5 criteria strawman proposal

Beware: Politics Ahead!

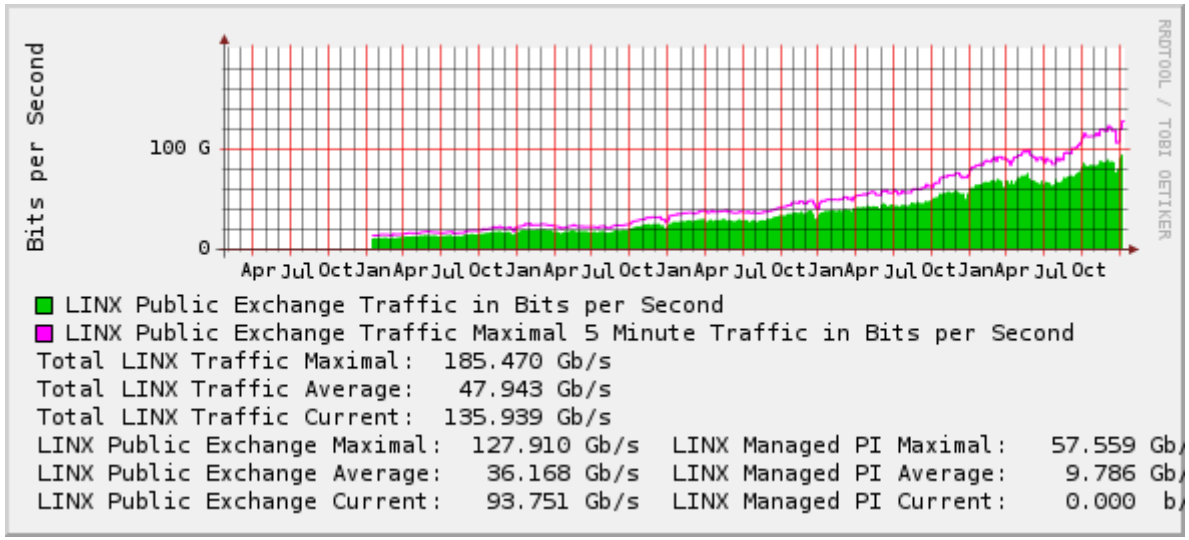
- Two interesting, conflicting presentations:
  - "Speeds and Feeds – Reality Check"
    - Sun arguing that 100G is too fast – won't meet "broad market potential", and that the speed objective should be 40Gbits/sec
      - They won't be able to use 100G/sec until 2014
    - Are they enclosed in a desktop/server vacuum?
      - Ethernet is replacing SONET/SDH in the core network!
  - "100Gbit/sec is not enough!"
    - Alcatel-Lucent arguing 100G is not enough
    - LAG will be essential, and we'll always be behind defining a fast enough interface – scaleable generic architecture needed

Demand Arguments

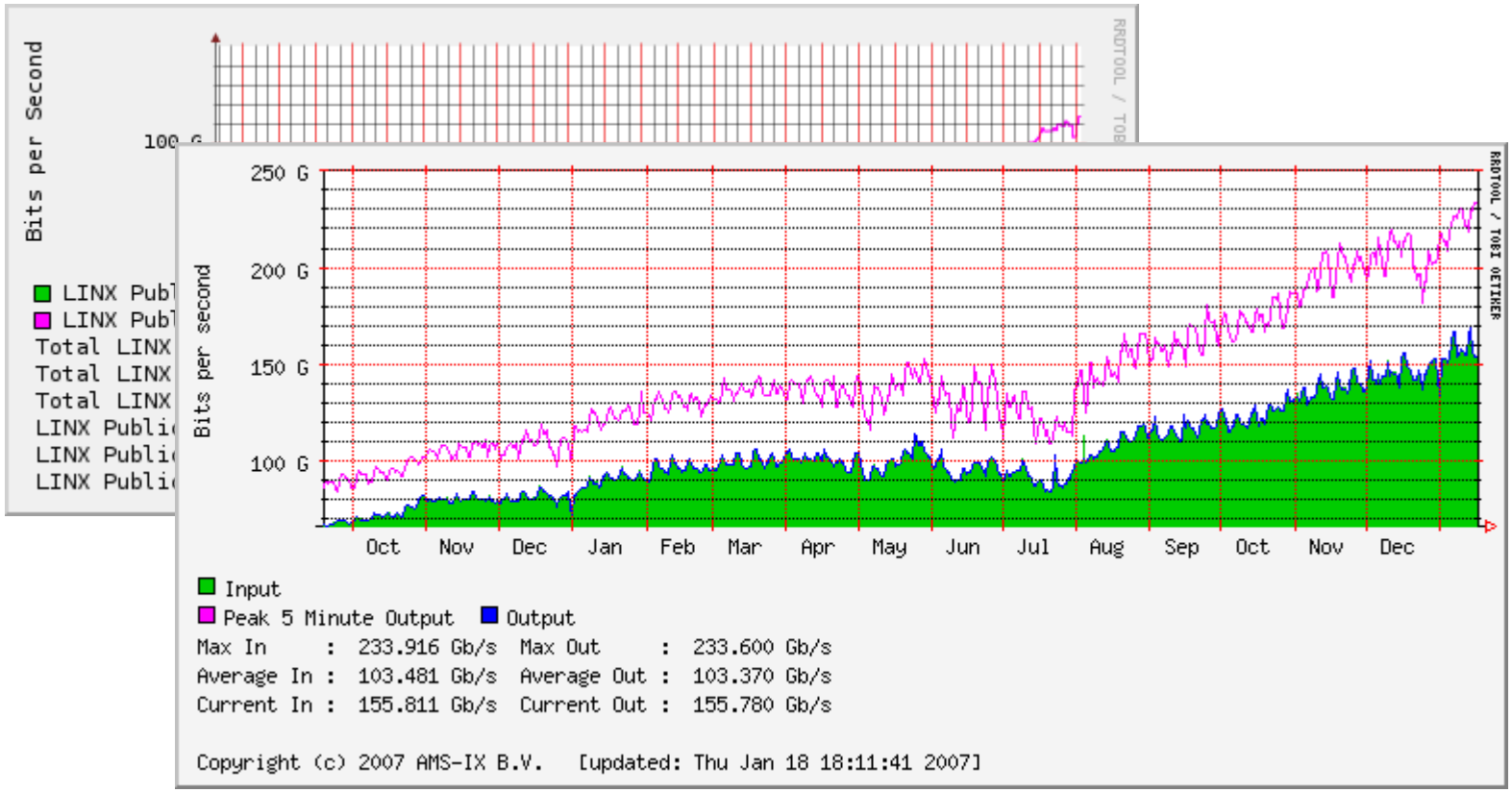
- The argument is that 10Gig “isn’t successful”
  - It hasn’t grown at the same rate as FastE or GigE did (hardly surprising though)
    - FastE: 1M host interfaces 1 years from Standard
    - GigE: 1M host interfaces ~2 years from Standard
      - Largely driven by 10/100/1000 copper ports
    - 10GigE: 1M host interfaces projected for ~6 years after Standard
- Is 100GE only being created for a niche market?

My Demand Argument

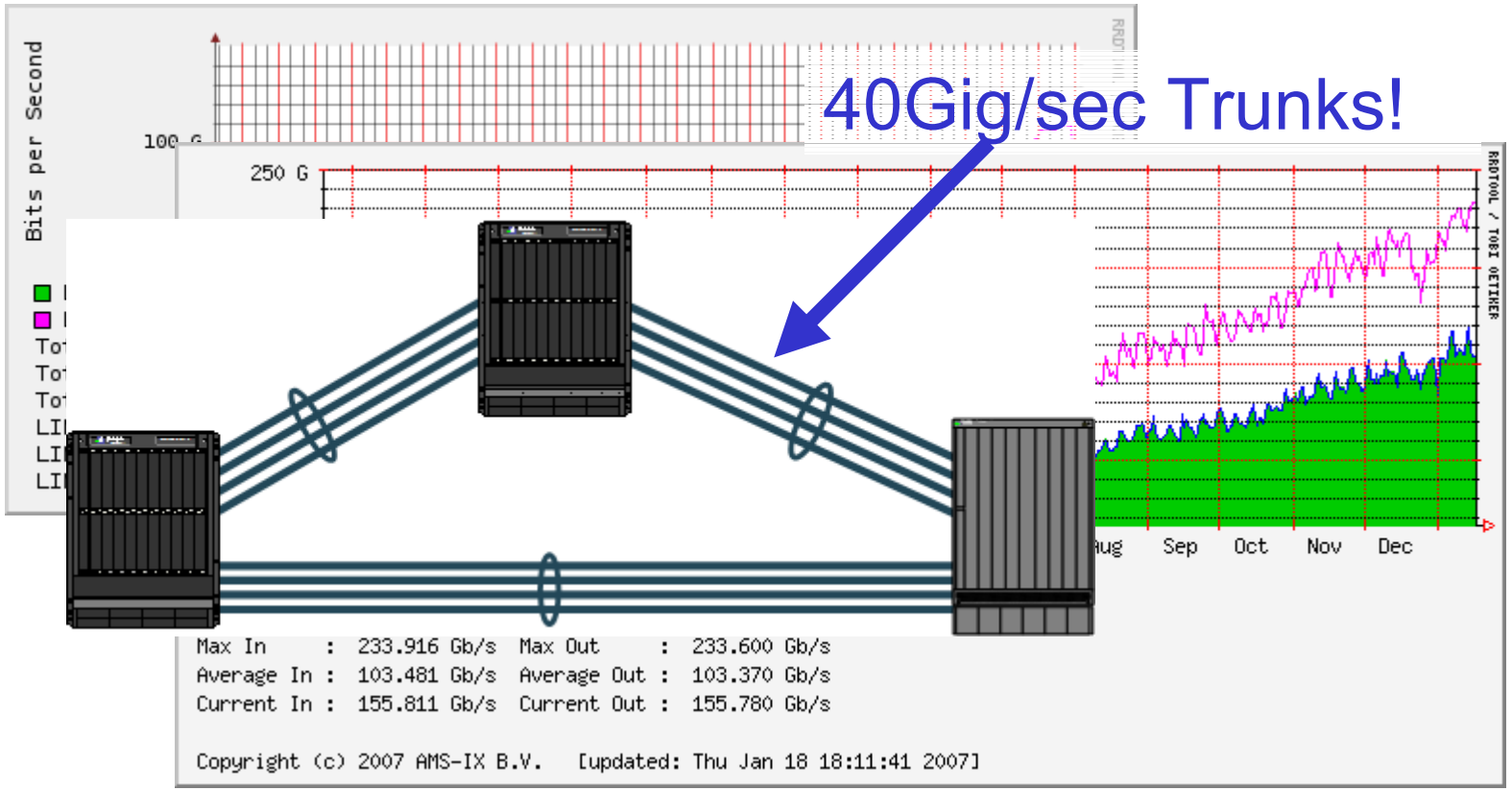
My Demand Argument



My Demand Argument



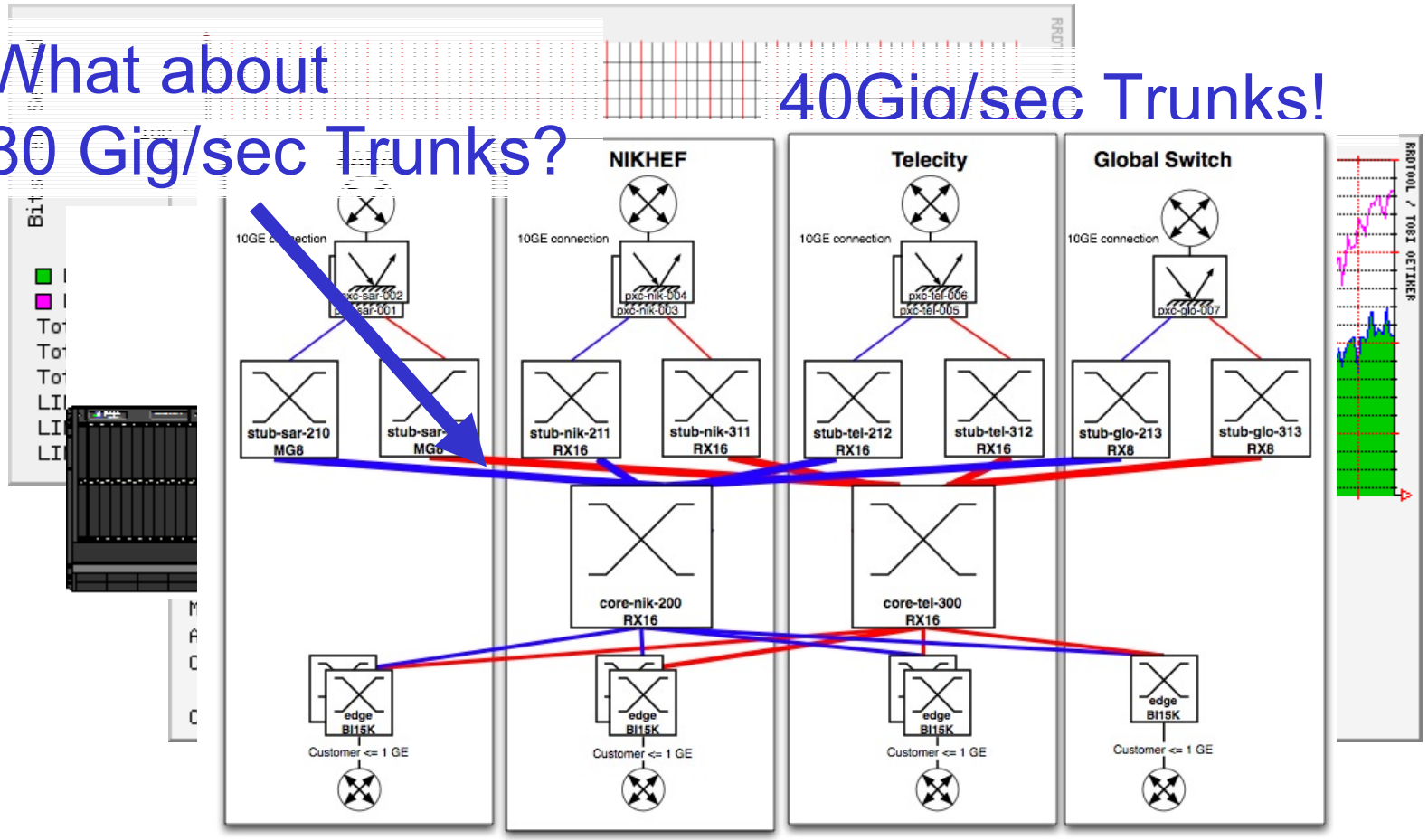
My Demand Argument



My Demand Argument

What about
80 Gig/sec Trunks?

40Gig/sec Trunks!



But there's good news…

- There are a number of people driving 100Gig forward
  - User community (IXPs, Backbones, CDSPs…)
    - We have a need – 10GE LAG scaling issues
  - Vendor community (Switch, Router vendors)
    - They want to meet the need
  - Opto-electronics community
    - Maybe they just like the challenge? ;-)
- Probably more "aye"s than "nay"s
  - Of 85 attendees in Monterey, only 23 said it was worth continuing work on a 40Gig Ethernet

It's all happening as we speak…

- The HSSG are meeting this week
  - http://www.ieee802.org/3/hssg/public/jan07/index.html
- Friday is the day for taking votes
- Hopefully the 5 criteria can either agreed up on, or at least more finely honed
  - The "usual" Ethernet scale-up criteria
  - 10x bandwidth, approx 3x price
- Fingers crossed that we've headed off the 40Gbit/sec camp, and get the 40km objective accepted!

Timeline from here…

- Route to the task force
  - March ’07 – IEEE Plenary, Orlando
  - May ’07 – HSSG Interim, Geneva
  - July ’07 – IEEE Plenary, San Francisco
    - Ballot here? 802.3xx number assigned?
  - November ’07 – First Task Force meeting?
- Based on other Ethernet Standards, expect…
  - 2009 – pre-Standard 100G implementations ship
  - 2010 – 100Gig Ethernet Standard adopted

Background Reading

- IEEE 802.3 HSSG website:
  - http://www.ieee802.org/3/hssg/
- HSSG mail reflector:
  - Open mail reflector, don't have to be IEEE member
  - listserv@ieee.org
  - Body text:
    - subscribe stds-802-3-hssg <first name> <last name>

Thanks

- Henk Steenman, AMS-IX
  - Being the “ears and eyes” of the European IX community at these meetings
  - Assistance with material
- Greg Hankins – Force10 Networks
  - Involving the operator community at an early stage

Questions?