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# 40G, 100G Ethernet or Both...

## How do we proceed?

**Dan Dove**

Dove Networking Solutions

for

ProCurve Networking by HP

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# Supporters

## List of Supporters:

Arne Alping – Ericsson

Joe Berthold – Cienna

Brad Booth – AMCC

Ralf-Peter Braun – T-Systems

Frank Chang – Vitesse Semiconductor

Xavier Clairardin – Kotura

Thomas Fischer – Nokia Siemens Networks

Larry Green – Ixia

Robert Hartman – Cyoptics

John Jaeger – Infinera

Wenbin Jiang – JDSU

David Koenen – HP Server Network Technology

Arlon Martin - Kotura

Tremont Miao – Analog Devices

Andy Moorwood – Extreme Networks

Gary Nicholl – Cisco Systems

Mark Nowell – Cisco Systems

Shashi Patel – Foundry Networks

Drew Perkins – Infinera

Karim Tatah – Cray

Sashi Thiagarajan – Cienna

Brad Turner – Juniper Networks

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# A review of HSSG Progress

This presentation is intended to demonstrate a strong effort has been completed by the HSSG to provide justification for a Project to be requested by the IEEE 802.3 to move forward into a 100Gigabit per second Task Force. It also addresses the question of one PAR or more.

It reviews the straw polls and motions of the Study Group with the objective of clearly articulating the progress and direction of the HSSG.

Some straw polls or motions may not be captured in this presentation if they were deemed to be irrelevant to the above objective in order to reduce space/time of the presentation but it is the assertion of the author that any poll/motions not included will not change the conclusion of this presentation.

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# A review of HSSG Progress

- July 2006 – CFI for higher speed
- Sept 2006 – Discussions on HSSG structure and directions
- Nov 2006 – A number of straw polls on MAC rate and multiple MAC rates, and a set of motions defining group consensus
  - I do not support adding more than one MAC rate. (Y 76 / N 5)
  - Rate not supported. (40 Gbps 89 / 80 Gbps 84 / 120 Gbps 45 / 100 Gbps 3)
  - 100G Rate supported. (Y 76 / N 2 / A 24)
  - Reach supported. (100 to 300m - MMF – 64 / 2 to 10 Km - SMF – 80 / 40 Km - SMF – 50)
  - MOTION approved for full duplex (Y 73 / N 0 / A 4)
  - MOTION approved for 802.3 frame format (Y 76 / N 0 / A 4)
  - MOTION approved for 802.3 frame size (Y 74 / N 0 / A 4)
  - MOTION approved for 100G MAC Rate (Y 67 / N 9 / A 14)
  - MOTION approved for 10Km SMF Link (Y 67 / N 9 / A 14)
  - MOTION approved for 100m MMF Link (Y 61 / N 3 / A 27)

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# A review of HSSG Progress

- Jan 2007 – Straw Polls
  - Support BER of (10e-12 - 42 / 10e-12 or better - 20 / None -1 / Abstain 12)
  - Single PAR (Y 63 / N 3 / A 18)
  - Broad Market Potential Shown for 100G (Y 52 / N 17 / A 16)
  - 100G / 10Km Technical Feasibility Shown (Y 66 / N 0 / A 12)
  - 100G / 10Km Economic Feasibility Shown (Y 37 / N 3 / A 38)
  - 100G / 100m Technical Feasibility Shown (Y 60 / N 1 / A 17)
  - 100G / 100m Economic Feasibility Shown (Y 34 / N 6 / A 39)
  - Broad Market Potential for 100G (Y 32 / N 5 / A 35)
  - Continue to study 40G (Y 22 / N 33 / A 21)
  - Adopt 100G / 40Km Objective (Y 38 / N 10 / A 32)
  - Single PAR (Y 28 / N 16 / A 32)

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# A review of HSSG Progress

- Jan 2007 – Motions
  - 100Gbps / 10Km Technical Feasibility Shown (Y 67 / N 0 / A 14)
  - 100Gbps /100m Technical Feasibility Shown (Y 64 / N 0 / A 17)
  - BER  $\leq 10e12$  (Y 68 / N 0 / A 4)
  - 100Gbps / 40Km Objective (Y 38 / N 10 / A 32)
  - 100Gbps /100m Technical Feasibility Shown (Y 64 / N 0 / A 17)
  - Adopt nowell\_01\_0107.pdf PAR proposal (Y 54 / N 1 / A 7)
  - Adopt compatibility criterion proposal (inc 100Gbps) (Y 54 / N 1 / A 6)
  - Adopt distinct identity criterion proposal (inc 100Gbps) (Y 53 / N 1 / A 5)
  - Adopt technical feasibility criterion proposal (inc 100Gbps) (Y 57 / N 2 / A 6)
  - Adopt economic feasibility criterion proposal (inc 100Gbps) (Y 48 / N 8 / A 8)
  - Adopt broad market criterion proposal (inc 100Gbps) (Y 39 / N 4 / A 9)

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# A review of HSSG Progress

- March 2007 – Straw Polls
  - Broad Market Potential for 100G (Y 71 / N 2 / A 10)
  - Continue to study 40G (Y 35 / N 33 / A 20)
  - Broad Market Potential for 40G (Y 23 / N 32 / A 36)
  - Support adding 40G to PAR A (Y 18 / N 32 / A 33)
  - 100G / 10Km Economic Feasibility Shown (Y 59 / N 0 / A 16)
  - 100G / 100m Economic Feasibility Shown (Y 47 / N 0 / A 25)
  - 100G / 40Km Technical Feasibility Shown (Y 30 / N 6 / A 40)
  - 100G / 40Km Economic Feasibility Shown (Y 12 / N 15 / A 50)
  - Add 100G / 40Km Objective (Y 14 / N 26 / A 43)
  - Add 100G Copper Objective (Y 34 / N 15 / A 36)
  - Present PAR A to Exec in July 07 (Y 48 / N 3 / A 28)

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# A review of HSSG Progress

- March 2007 – Motions
  - Extend HSSG (Y 58 / N 0 / A 0)
  - Reword Economic Feasibility Criterion Response (Y 59 / N 1 / A 4)
  - Reword Broad Market Criterion Response (Y 62 / N 0 / A 8)
  - Single PCS (Y 132 / N 43 / A 15) – Ruled Out of Order
  - Rule prior motion in order (Y 45 / N 5 / A 22)
  - HSSG Has Demonstrated Market Potential (inc 100Gbps) (Y 59 / N 5 / A 12)
  - 100G / 10Km Economic Feasibility Shown (Y 52 / N 1 / A 11)
  - 100G / 100m Economic Feasibility Shown (Y 54 / N 0 / A 10)
  - Modify Floor Speaking Format (Y 14 / N 52 / A 12)



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# A review of HSSG Progress

- April 2007 – Straw Polls (from unapproved minutes)
  - Broad Market Potential for 40G (Y 24 / N 24 / A 26)
  - Support adding 40G to PAR A (Y 22 / N 24 / A 24)
  - 100G / 40Km Technical Feasibility Shown (Y 50 / N 0 / A 10)
  - 100G / 40Km Economic Feasibility Shown (Y 35 / N 1 / A 24)
  - Add 100G / 40Km Objective (Y 48 / N 1 / A 15)
  - Broad Market Potential of 10m 100G Copper PMD (Y 55 / N 0 / A 9)
  - Support 10m 100G Copper PMD Objective (Y 51 / N 0 / A 12)
  - Technical Feasibility of 10m 100G Copper PMD (Y 44 / N 3 / A 18)
  - Economic Feasibility of 10m 100G Copper PMD (Y 38 / N 3 / A 21)
  - Add 10m 100G Copper PMD Objective to PAR A (Y 35 / N 2 / A 23)
  - Data Rate Objective (100G Only 27 / 40G & 100G 26 / No Opinion 14 )
  - CERN Tour (Y 31 )
  - If a 40G PAR Belongs in (PAR A 28 / Separate HSSG PAR 16 / Separate SG 16)
  - Delay PAR A for 40G (Y 0 / N 39)

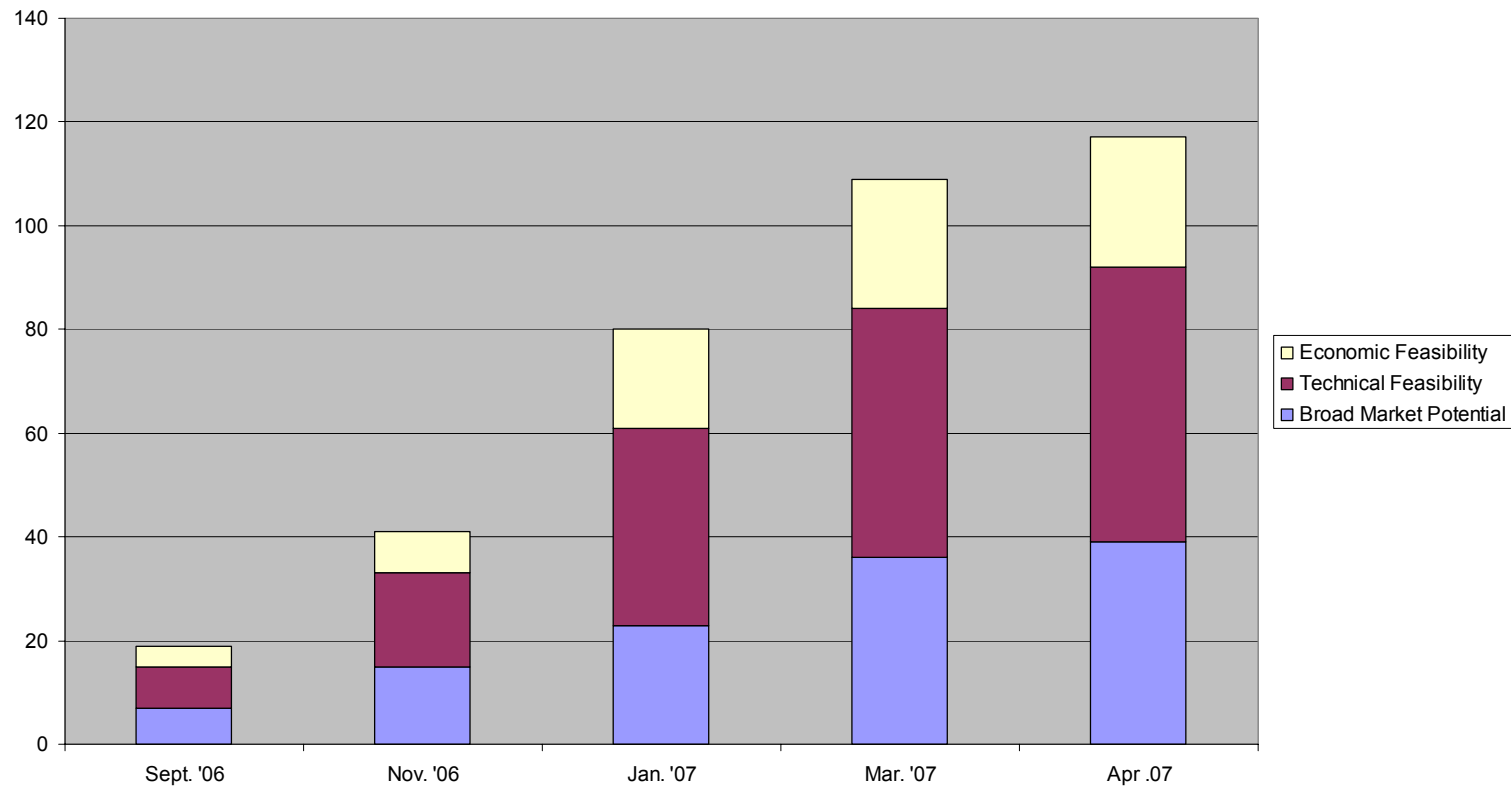
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# A review of HSSG Progress

- April 2007 – Motions (from unapproved minutes)
  - Add 100G / 40Km PMD to PAR A (Y 49 / N 1 / A 11)
  - Adopt 100G / 10m Copper PMD objectives (Y 51 / N 0 / A 15)
  - Add 100G / 10m Copper PMD to PAR A (Y 47 / N 0 / A 22)

# A review of HSSG Progress

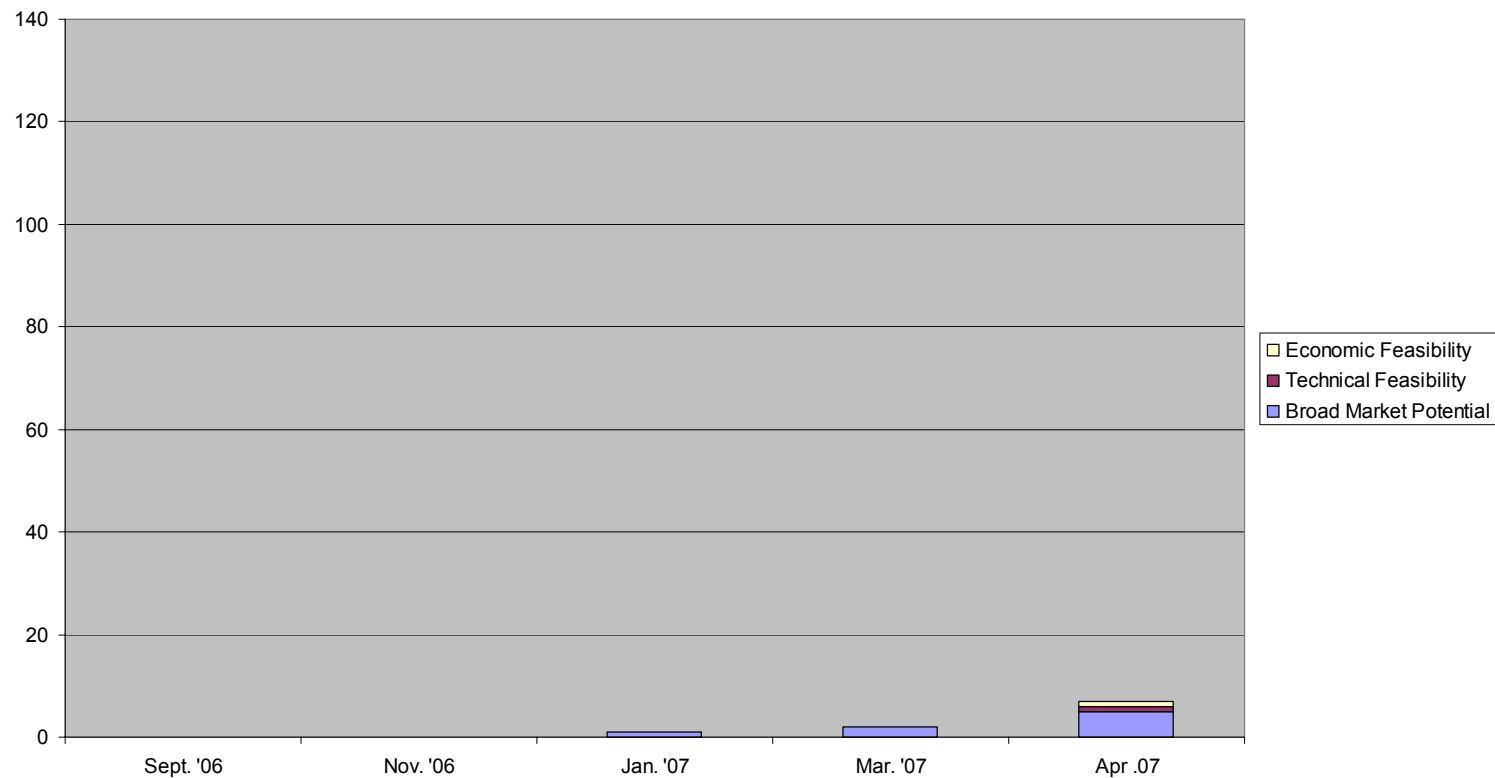
## Cumulative 100G Presentations



Data provided by John Jaeger  
Some presentations contribute to multiple categories

# A review of HSSG Progress

## Cumulative 40G Presentations



Data provided by John Jaeger  
Some presentations contribute to multiple categories

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# Conclusions:

- 100G Ethernet has been soundly demonstrated to have Broad Market Potential, Distinct Identity, Economic Feasibility, Technical Feasibility, and Compatibility with 802.3
- HSSG has already requested an extension and further delay to the project will impact adoption of 10G and 100G Ethernet
- Straw Polling and Motions show that the HSSG does not want to delay 100G for 40G
- Lack of supporting presentations for 40G broad market potential, technical and economic feasibility are going to demand more time
- The HSSG should move forward with PAR A (100G, 40Km, 10Km, 100m, 10m)
- 40G should either move forward as PAR B or with a CFI and Study Group, however 802 rules provide