Why We Are Here

- Broad level of interest in a solution between 1Gbps and 10Gbps in speed and cost
- Wide belief that 2.5Gbps can provide good cost/performance
- Discussions on 2.5Gbps solutions have been underway outside the standards forum
- It is time to bring 2.5Gbps into 802.3 and study its potential as a standard speed

Should IEEE 802.3 form a Study Group to develop a standards project proposal (a PAR and 5 Criteria) for 2.5Gbps Ethernet?
Tuesday Night’s Agenda

- Server Perspective
  - David Koenen, HP
- Switch Perspective
  - Bruce Tolley, Cisco
- Feasibility Perspective
  - Scott Powell, Broadcom
- Q&A
- Straw Poll of Audience
Why 2.5Gbps Ethernet

- A low cost, low power speed upgrade for 1Gbps is needed for server and switch applications.
- 2.5Gbps is the only proposal for higher speed over the installed cable base
  - Majority of installed cable plants are Cat 5e:
    > 450 million Cat 5e ports by 2005
  - Majority > 68% of installed fiber plants are MMF
- 2.5Gbps is close to the maximum rate achievable over a worst case 100m Cat 5e channel
5 Criteria Can Be Met

- **2.5Gbps has a distinct identity**
  - It is the only incremental speed solution for the currently installed, and forecast to be installed, base of ISO/IEC 11801 UTP infrastructure.

- **2.5Gbps is technically feasible**
  - Functional over entire installed base of Cat 5e/6 UTP
    - Worst case 100m channel per 11801
  - Functional over Fiber installed base
    - 100/300m MMF SX/LX, 10km SMF LX
  - One quarter lane of XGMII and XAUI shipping in volume today
  - Optical components for 2.5Gbps SX and LX are available today

- **Minimal impact to 802.3 standard**
  - Leverages existing clauses
  - Backward compatible with 10/100/1000

- **2.5Gbps is economically feasible**
  - Cost and power dissipation fractionally more than 1000Base-T
  - Protects multi-billion dollar investment in infrastructure
  - 4G fiber modules are becoming cost competitive with 1G

- **2.5Gbps has broad market potential**
  - Near term requirement for Server LOM market
  - Today's server is tomorrow's high volume desktop
  - Switch stacking and uplinks
  - Economics are right for wide deployment
## Contributors and Supporters: Individuals from System Vendors

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Volunteers to Work on 2.5Gbps

- **Attendees** that would participate in a 2.5Gbps Study Group in IEEE 802.3.
  
  Count: **42**

- **Organizations** that support participation in a 2.5Gbps Study Group in IEEE 802.3.
  
  Count: **32**
Straw Poll Tuesday Evening

Should IEEE 802.3 form a Study Group to develop a project proposal for 2.5Gbps Ethernet?

Attendees - Y: 53  N: 64  A: 39

802.3 Voters - Y: 20  N: 29  A: 21
Concern: Not 10x Speed Upgrade

Response:

- Market data show that the transition from 1G to 10G will be much slower than from 10M to 100M, or 100M to 1G.
- Switch and Server vendors believe a large % of applications will be satisfied by 2.5Gbps over the next five years.
- There is no other 10X improvement for the majority of the installed base.

[Graph showing Ethernet Switch Port Shipments from 1993 to 2007]
Concern: 10x Speed 3x relative Price?

Response:

- Total solution cost of 2500BASE-T will be very close to 1000BASE-T
  - No change in cost of cabling, connectors
  - Minimal cost adder for silicon
  - No change to other system component costs

- 2.5Gbps total cost will be better than the 10x performance / 3x price curve.

- 2.5G optics will be very close to 1G prices, and are available today

- Better, cheaper, faster.
**Concern: Cable will be upgraded if necessary to support higher speeds**

**Response:**
- True, but the end customer would rather not.
- The success of 1000BASE-T is due to compatibility with the installed cable.
- The installed base was approximately 20 million nodes in 1993. The installed base has been estimated to be close to 1 billion nodes in 2005; ~1/2 will be Cat 5e
- Higher grade cable makes sense for new installations, but a requirement to upgrade cable will slow deployment of next generation equipment.
Concern: Cannibalizing 10G?

Response:

- 2.5G complements 10G
- 10G is for backbone, uplinks and data center applications, primarily
- >90% of the volume is in the horizontal segment
- 2.5G volume in the horizontal segment will drive more 10G volume, and drive down prices of 10G faster.
Concern: 2.5G may take people from 10GBASE-T standards effort

Response:

- **Resources to work on projects are not fixed; they expand based on interest and belief in market viability**
- More than **30 organizations volunteered** to commit resources to 2.5Gbps
- Most of the volunteering organizations have not had significant participation in 10GBASE-T
Next Steps

Objections should be addressed in detail in a **Study Group**

Request straw poll of 802.3 support for **Study Group**