Viewpoint on Future Rate Progression

Paul Kolesar
CommScope
May 13, 2014
Ethernet Alliance – 40G Serial PMD discussion
Norfolk, VA

Framework and some key questions

- Current discussion centered on 40G Serial solutions
  - XLAUI-1
    - Distinct from 802.3bg (40G-FR) w XLAUI (would become XLAUI-4)
    - Encode with NRZ or higher-level modulation?
  - 40G-CR
  - 40G-SR
  - 40G-LR
  - 40G-ER

  Some or all?

  Only SFP dissipation compatible?

- Targeting a March 2015 CFI
  - If initiated SG competes with P802.3bs for time & resources
    - Can these two work items be effectively accomplished in parallel?

Further questions and observations

- How are the industry's resources best spent?
  - Refining 40G (for gen 2) ⟵ 40G Serial address this one
  - Refining 100G (for gen 3)
  - Refining 400G (for gen 2)
  - Adding higher rate

  } 50G lane rate benefits all three

- Need we progress incrementally?
  - If yes, then 40G Serial is next step
  - If no, then 50G lane rate is more impactful
  - Tackle 40G & 50G projects in parallel, with overlap, or serially?

What problem does 40G Serial solve?

Standard

PMD	Main utility	Media
40G-CR4	Server to ToR	4 twinax pairs
40G-SR4	ToR – Agg	4 MM pairs
40G-FR	Intra-CO	1 SM pair
40G-LR	Inter-CO, inter-DC	1 SM pair
40G-ER	WAN	1 SM pair
40G-T	Server to ToR, MoR, EoR	4 copper pairs

Proprietary

PMD	Main utility	Media
40G-eSR4	All inter-switch	4 MM pairs
40G-BiDi	ToR – Agg	1 MM pair
Others?		

Already a solution for nearly every problem.

What problem does 40G Serial solve?

- If the purpose is to reduce cost for server-ToR
  - We don't need anything but XLAUI-1 and 40G-CR
- But even doing just this will divert resources away from 50G lane development
  - Do we accept delay of 100G gen 3 and 400G gen 2?
  - What about 64GFC?

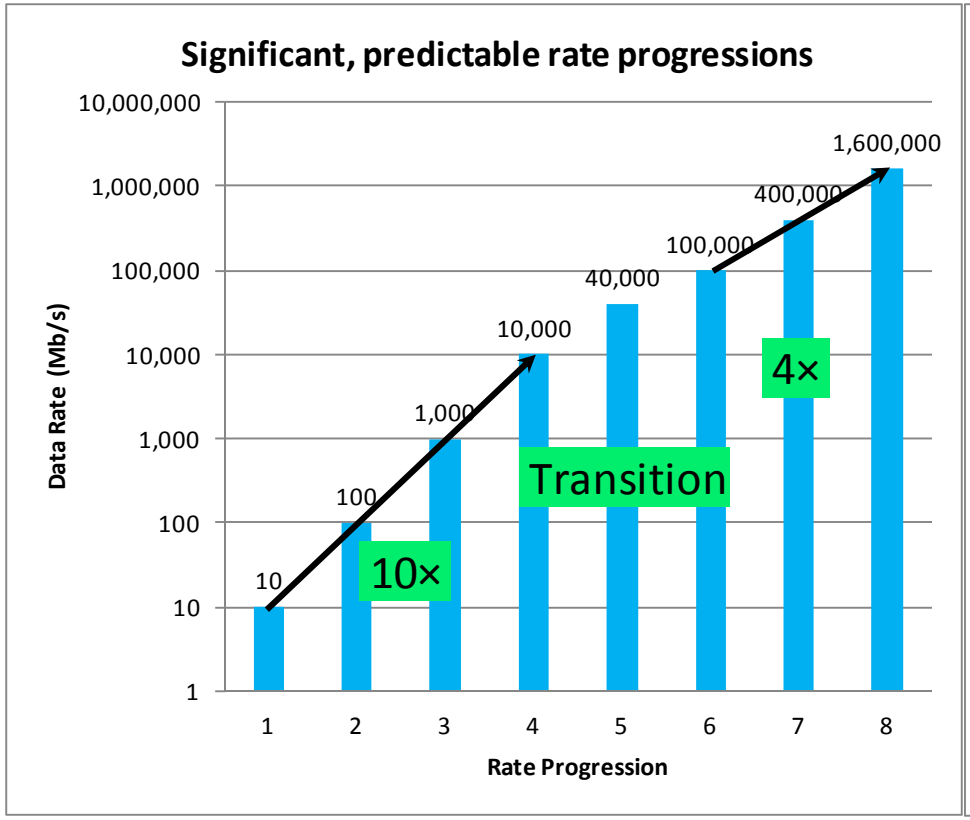
What happens after XLAUI-1?

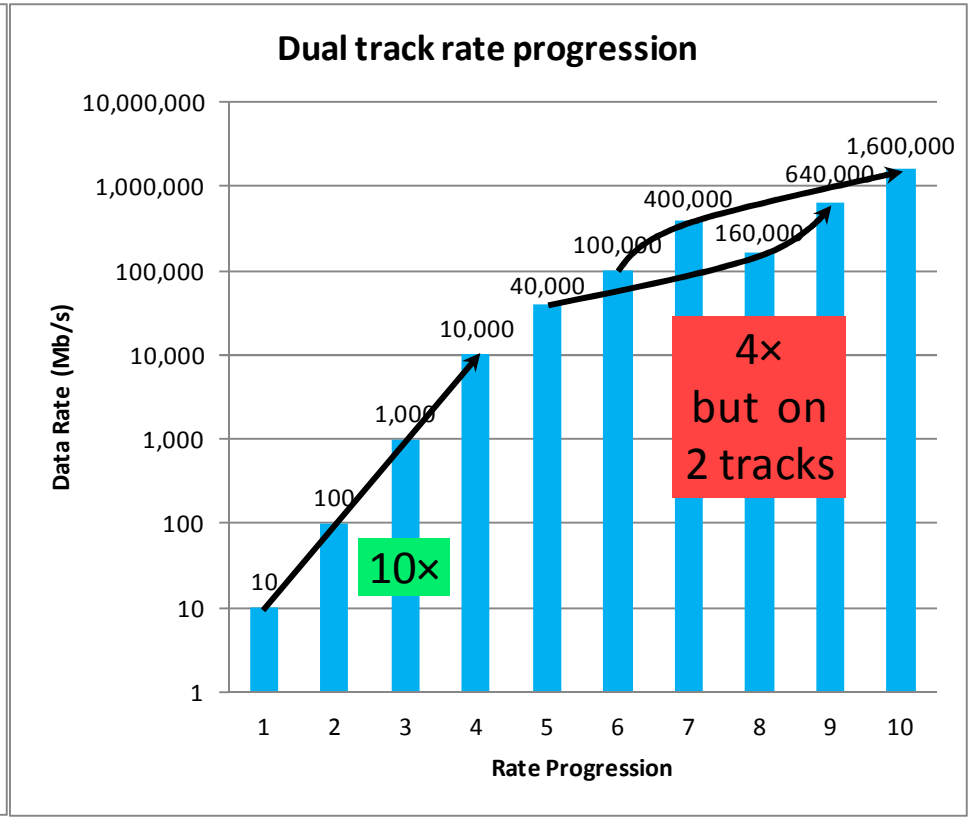
- Temptation to multiply it
  - 4× for 160G
  - 8× for 320G
  - 16× for 640G

  } But these do not fit the current progression established by 100G to 400G

- Need to re-establish predictable rate progression
  - 10× from 10M to 10G helped build Ethernet's success
    - Then 40G arrived with 100G which clouded the picture
  - 400G can re-establish a 4× progression and remove uncertainty
    - But only if XLAUI-1 does not trigger a dual track progression

Clarity vs Confusion





Uniform, significant steps.
Minimizes churn w 1 step to > Tb/s.
Good ROI & volume potential.

Uneven, non-monotonic steps.
More product churn, overlap.
Industry fragmentation, lower volume.

Summary and Conclusion

- XLAUI-1 presents opportunity and a crossroads
  - Our choices have long-term consequences
- Without structure the Ethernet ecosystem can go astray
  - Fragmenting under too many choices
- Establish a holistic rate-progression framework
  - Looking multiple steps into the future
  - Before standardizing XLAUI-1

Q & A