

IEEE 802.3 NG-ECDC The Path Forward

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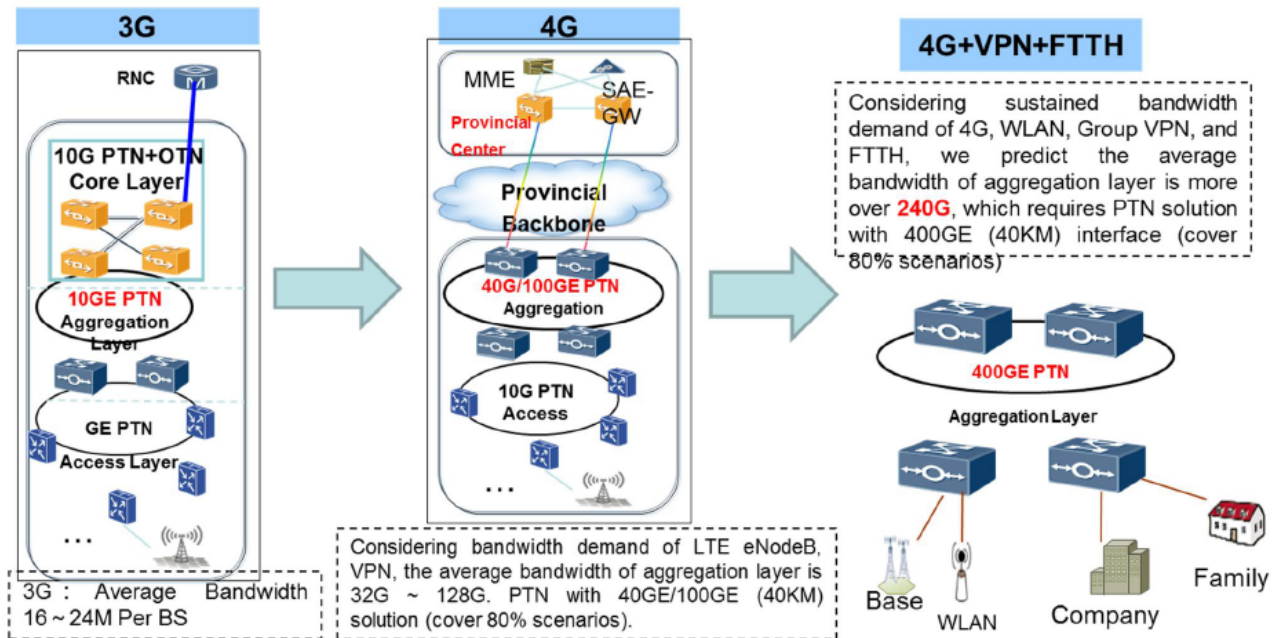
Historical Perspective

- Jan 2016
 - 400GbE Extended Reach PMD, Yoshiaki Sone NTT
- March 2016
 - 400GE Requirement in MBB and FBB, Lu Huang China Mobile
 - FEC Options for Extended Reach of 50/200/400GbE, Wang, Yang, Wang Huawei
- May 2016
 - Optical transmission feasibility for 400GbE Extended Reach PMD, Yoshiaki Sone, NTT

China Mobile Use Case

Link Scenario in Mobile Broadband Backhaul Network

- Based on Ethernet technology, we choose PTN to build the mobile backhaul networks of China Mobile
- Because backhaul network is in metro area, where is usually lack of OTN, most of link between PTN nodes are direct fiber connection
- With the large scale deployment of TD-LTE, PTN is evolving from 10GE to 40GE/100GE, and we believe 400GE will be necessary in the near future

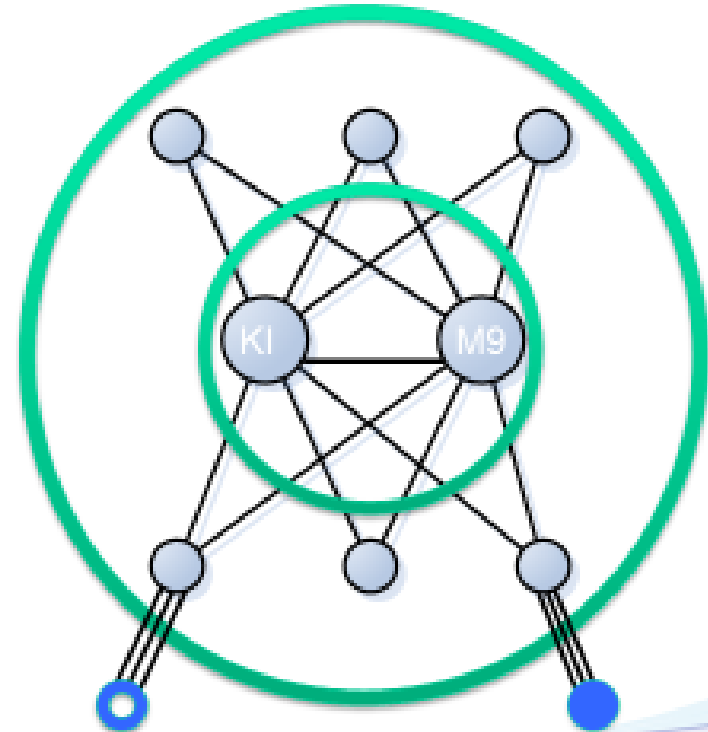


Source: http://www.ieee802.org/3/ad_hoc/ngrates/public/16_03/huang_ecdc_01_0316.pdf

Industry Discussions- MSK-IX

Double Core Specifics

- MLAG interaction between KI & M9 (~40km distance)
- Passive 10G DWDM solution between core, predictable network size
- Smooth migration from old equipment to a new one
- Ring-topology concept:
 - Tier 0 – connect core to each other,
 - Tier 1 – core datacenters and switches,
 - Tier 2 – edge datacenters.
- Current capacity between several Tier1 switches and Core: 640Gbps (n x 10G) with Future plans 100G+ links between them.
- **Need solution for 100G+ optical transceivers between Core & Tier1 up to 40 km**



Historical Perspective – OFC2016

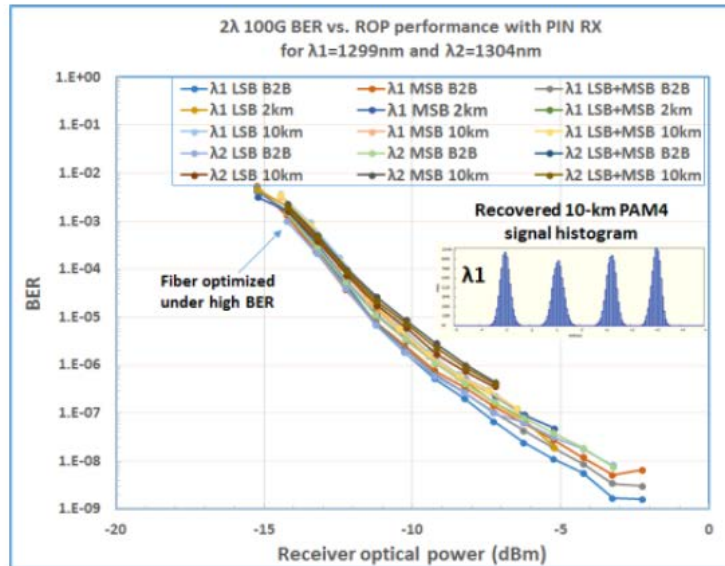


Fig. 5: $2\lambda \times 50\text{G}$ PAM4 transmission results with PIN RX

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- Continuing industry research underway – $2 \times 50\text{G}$ PAM4
- “Link Performance Investigation of Industry First 100G PAM4 IC Chipset with Real-time DSP for Data Center Connectivity”
- Chang, Bhoja, Riani, hosagrahar, Wu, Herlekar, Tiruvur, Khandelwal, Gopalakrishnan

Perspective

- Use cases emerging, but more work is needed here
 - 4G Deployments?
 - Other Providers?
 - Beyond 4G?
 - Other application spaces
- Technology advancements happening
 - PAM₄
 - FEC
- IEEE 802.3 has 3 key optical projects underway
 - Two speeds beyond 100GbE: 200GbE and 400GbE

Optical Ethernet Standards In-Development

Medium		25 G	50 G	NG 100G	200G	400G
MMF	100 m		1x50G	2x50G	4x50G	16x25G *
	500 m				4x50G	4x100G *
SMF	2 km		1x50G		4x50G	8x50G *
	10 km	1x25G	1x50G		4x50G	8x50G *
	40 km	1x25G				

IEEE P802.3bs

IEEE P802.cd

IEEE P802.3cc

* - baselines selected, if not marked, then baselines pending

Ad Hoc Output

- Multiple types of deliverables –
 - Will provide records of the meetings, including minutes and supporting presentations.
 - May be the creation of one or more consensus presentations that are used as the basis for one or more Call-for-Interests to study new areas.
 - May be the creation, as appropriate, of white papers documenting the findings of the IC activity.
- Groups need to provide guidance on their proposed output

What is the Path Forward

- Gathering findings on marketing use cases and technical solutions are necessary for a CFI.
 - Call-for-Interest?
 - White Paper?
- Suggest summary presentations
 - Technical feasibility
 - Marketing use cases



Thank you!