Future-proofing and Fiber Architecture
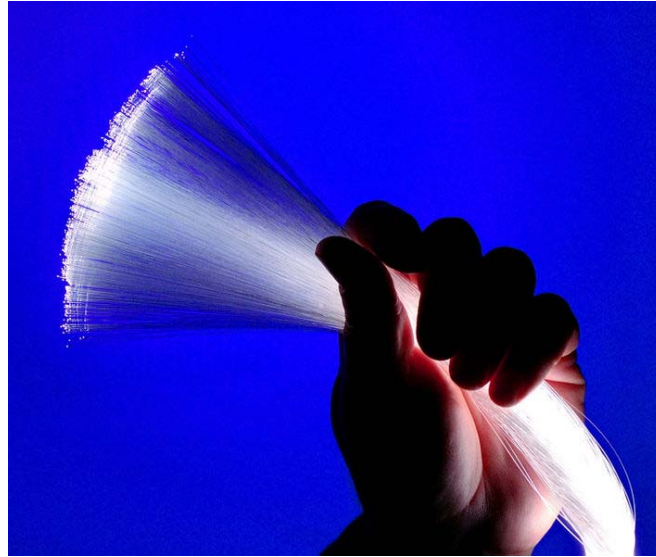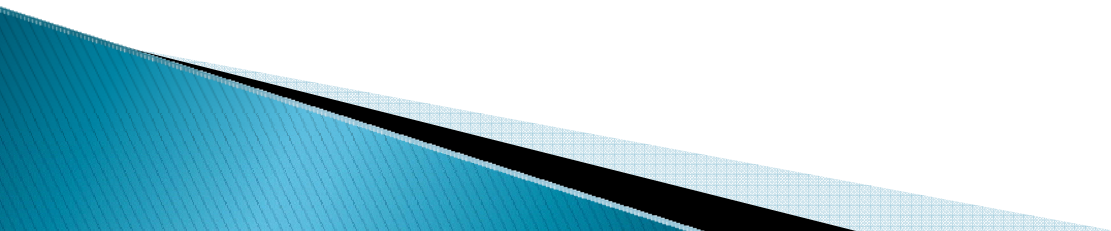
Johan Henæs
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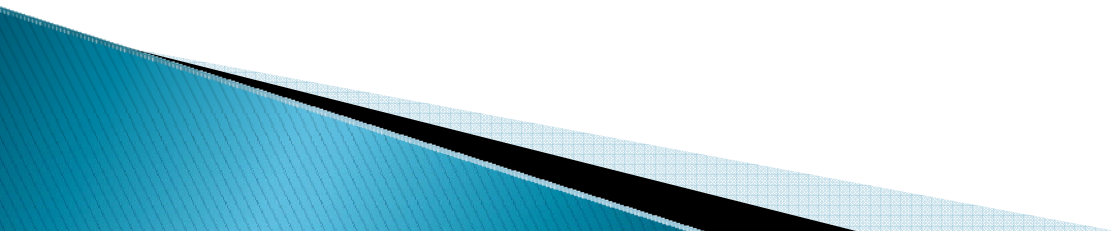
- Electronics Engineer
- Network design and implementation
- CTO / VP Sales for Optical component company working on WDM-PON
- Initiator of GIGAWAM project
- Recently established System Integrator INS Communications in Norway

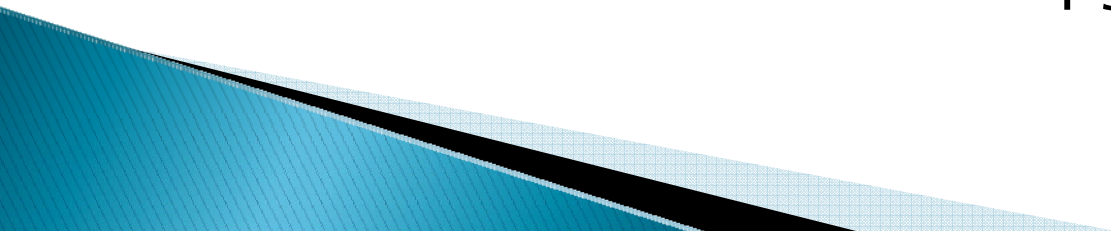*"To be ignorant of what occurred before you were born is to remain always a child."*

Marcus Tullius Cicero – 106 BC – 43 BC

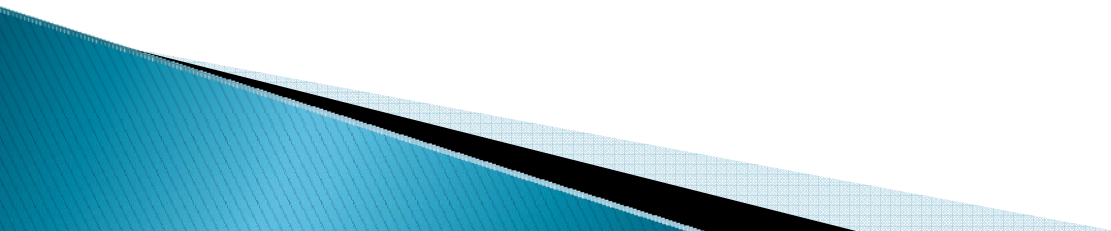# History

- 1987 : BT start developing and rollout of TPON – Telephony on Passive Optical Network
  - 8x16 split in the field
  - 128 end users served Telephony with a 64kbit ISDN channel pr. Subscriber.
- Broadband upgrade planned via B-IDSN (ATM)
- 30.000 subscribers installed

- 90's :
  - APON – ATM-based, but 32 split
  - Later ATM dies
- July 2003 : BT starts replacing TPON with "Copper Overlay" (ADSL rollout)
- Project ends late 2005

- (Similar project – OPAL Early 1990's)
  - Deutche Telekom forklift-upgrade 200k users

What have we learned?

- Services cannot be predicted
- Network design and technologies need to offer flexible and scalable platform for tomorrows services
- Why build OSP that can only support FTTH ?
  - B2B
  - Wireless backhaul
  - CO Consolidation
- NG-PON2 will be deployed within 5-10 years, Change to OSP needed
  - (European deployments mostly P2P)

WDM-PON an attractive solution

> OLT and ONTs communicate over separate wavelengths

> Uses WDMA for Multiple Access

Central Office

– Best Performance BW vs $ Today
– Symmetrical Bandwidth (P2P)
– Scales Beyond 100MBPS, 1GBPS, 10GBPS pr User
– No change to OSP the next decades
–WDM Already in Core / Metro
–10% OF P2P OPEX + save fiber cost
= Combines P2P and PON

OLT

$\lambda_1 \cdots \lambda_N$

AWG

λ_3

λ_N

ONT #2

ONT #3

ONT #4

ONT #N

AWG (Arrayed Waveguide Grating)

WDM PON FORUM

WDM PON Forum overview / objective

- The WDM PON Forum Group is an interest group of services providers, equipment suppliers, component vendors and analysts to work towards a common goal of providing WDM technology based broadband access networks.
- The goal of the WDM-PON forum is to provide a resource for researchers, component and equipment suppliers, carriers, and other parties interested in passive optical networking technologies that utilize dedicated wavelengths as a method to provision services in access networks and to promote and advance the technologies required to enable cost-effective wavelength division multiplexing in Passive Optical Networks.

Group located on Linkedin under group "WDMPON Forum"

- http: www.linkedin.com/groups?gid=2025479&trk=myg_ugrp_ovr

- WDM PON Forum will be extended 2010 to
  ### www.fiberin.com

Current Group Member status
- 160+ members
  - Carriers / vendors / Media / analysts

www.fiberin.com

11/14/2009