

# 40 Gb/s Ethernet optimized for client applications in the carrier environment: BROAD MARKET POTENTIAL

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# List of Supporters

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- Hideki Isono, Fujitsu Optical Components
- Satoshi Obara, Fujitsu Limited
- Jeffery J. Maki, Juniper Networks, Inc
- Kazuyuki Mori, Fujitsu Optical Components
- Koichiro Seto, Hitachi Cable
- Hidenori Takahashi, KDDI Labs
- Hidehiro Toyodo, Hitachi
- Kathy Tse, AT&T

# Broad Market Potential in Carrier Applications

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- 40Gb/s Ethernet optimized for client applications in the Carrier environment accelerates the transition to Ethernet services, and increases the global Ethernet footprint.
- Market Analysis shows 40G unit volume shipments following a similar growth pattern the way 10G unit shipments did, indicating a clear market potential for this interface.

Thus, a project to develop a 40G Ethernet serial interface standard optimized for the Carrier environment creates a broad set of new, cost effective applications for Ethernet in metro and long haul networks.

## Widespread support for a 40GE SMF PMD

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- At the IEEE 802.3 Working Group Meeting in Atlanta (Nov 2009), a broad range of device vendors, systems vendors and network operators concluded in a Call-For-Interest that:
  1. A Carrier-optimized SMF client interface is needed to enable accelerated penetration of 40GE into Carrier networks.
  2. The adoption of a 40GE SMF interface into the Carrier network environment strengthens the whole Ethernet ecosystem.

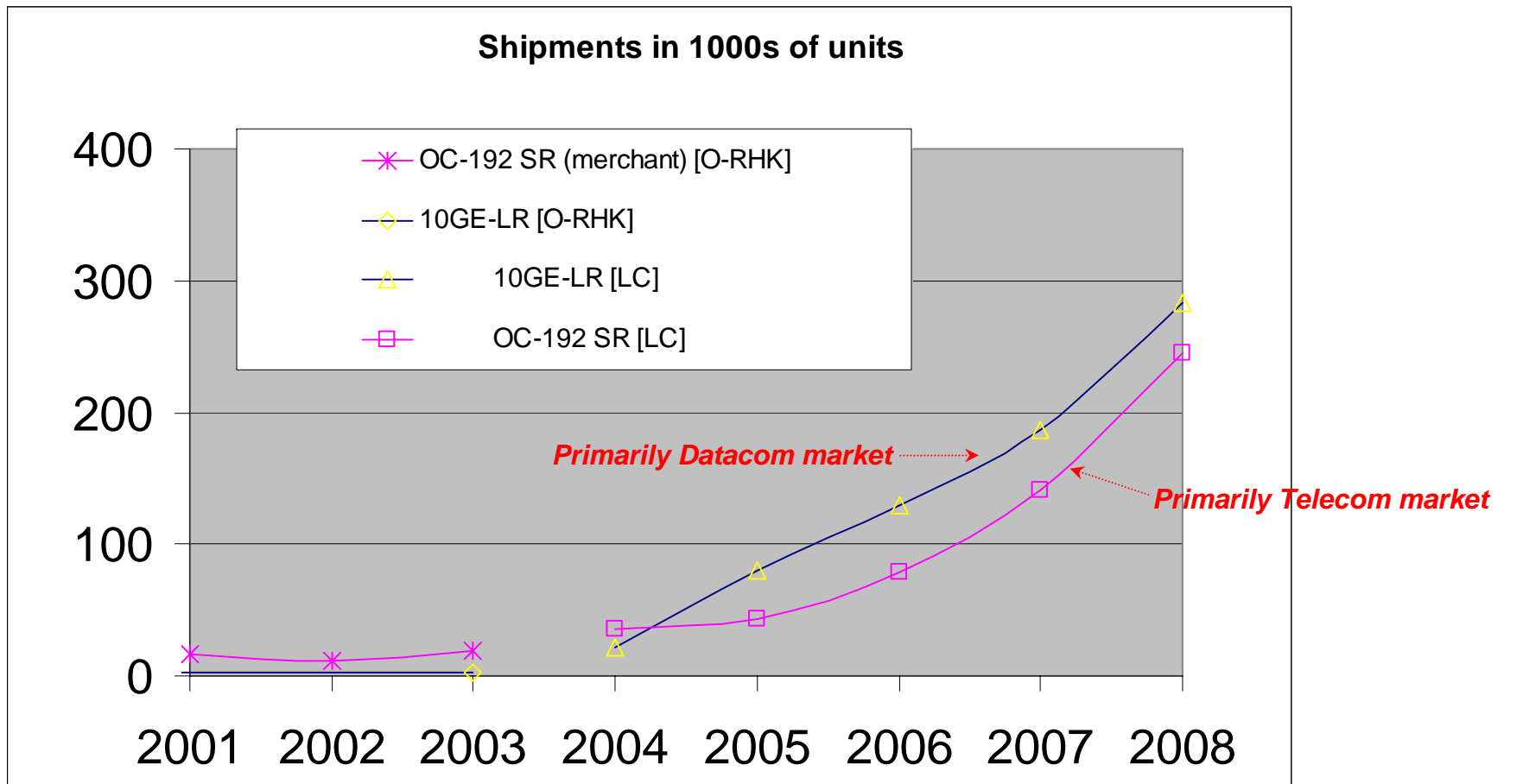
# Market Analysis - 40G Unit Volume Shipments: Historical & Projected Data

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- Analysis: 40G Unit Volume Projections were compared to historical 10G Unit Volume shipments
- 40G projections were provided by 6 carriers to Finisar under NDA with the strict requirement that only aggregated projections are reported publicly:

AT&T	Deutsche Telekom (DT)
British Telecom (BT)	KDDI
China Telecom (CT)	NTT
- The individual 40G projections were not shared by Finisar with any of the other co-authors of this presentation.
- In the following analysis:
  - O-RHK : indicates Ovum-RHK data
  - LC : indicates LightCounting data
  - CD : indicates Carrier Data

# Market Data: Historical 10G Unit Volume Shipments



**Unit volumes are from LightCounting (LC) and Ovum-RHK (O-RHK) for all form factors**

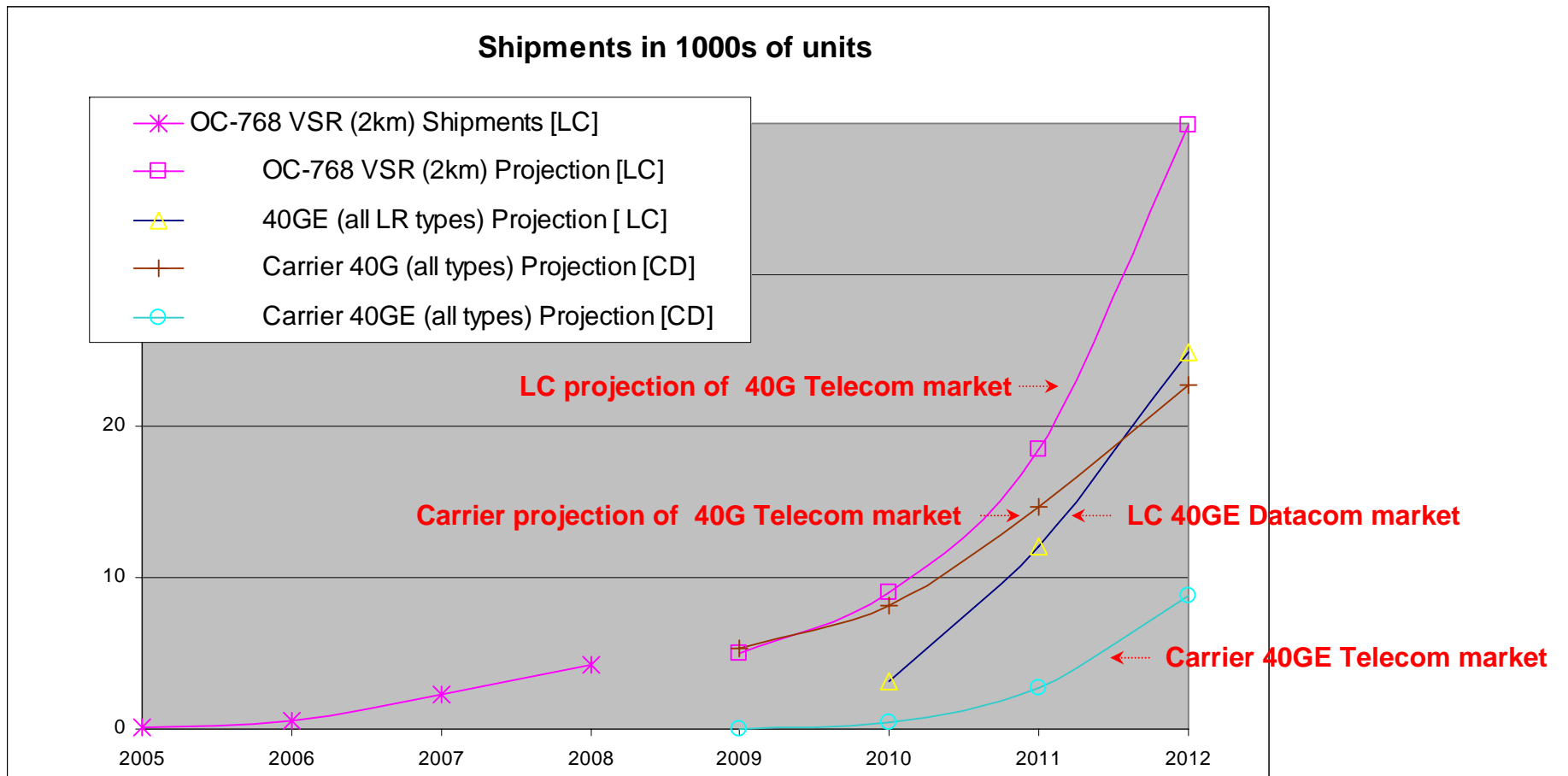
## Market Analysis - 40G Unit Volume Shipments: Historical & Projected Data

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40G Unit Volume Projection Slide (page 8) - Notes:

- LightCounting OC-768 VSR (2km) represents a projection of the **total** 40G port unit volume telecom market.
- Carrier Data 40G (all types) represents a projection of the **total** 40G port unit volume telecom market.
- LightCounting 40GE (all LR types) represents a projection of the **total** datacom 40G Ethernet unit volume market.
- Carrier Data 40GE (all types) shown is a conservative estimate of the **total** telecom 40G Ethernet port unit volume market.

# Market Analysis: Historical and Projected 40G Unit Volume Shipments



**Unit volumes are from LightCounting (LC) and Carrier Data (CD) for all form factors. LC projections use a mathematical model developed by LightCounting**



## Market Analysis - 40G Unit Volume Shipments: Historical & Projected Data Comments

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- Historical 10G unit shipment volumes for datacom and telecom applications are similar.
- Projected 40G unit shipment volumes are following 10G trends.
- Projected 40G unit shipment volumes for datacom and carrier applications are both significant.

*Carriers are predicting demands for 40GE services over the next 5 years will eventually match and surpass older transport options (i.e., POS, packet over SONET). Thus, a 40G interface optimized for this market will help increase the overall Ethernet footprint.*

# Broad Market Potential

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- a) Broad sets of applicability.**
- b) Multiple vendors and numerous users.**
- c) Balanced costs (LAN versus attached stations).**
  - There is a significant and growing deployment of 40G serial interfaces in carrier networks and in access to carrier networks. Quantitative presentations have been made to the 802.3 40Gb/s Ethernet Single-mode Fibre PMD Study Group indicating significant market opportunity.
  - A growing share of the traffic in carrier networks is comprised of Ethernet and Ethernet services. Alternative technologies such as 40G POS (packet over SONET) are deployed in today's networks due to the lack of a serial Ethernet 40G interface
  - 88 participants attended the 40Gb/s Ethernet Single-mode Fibre Call for Interest. 40 people from 34 companies indicated they would participate in the project. 61 indicated this is the right time to start, with nobody opposed. This level of commitment indicates that a standard will be supported by multiple vendors.
  - The target market for the 40Gb/s SMF PMD is carrier networks, for which volumes may be more modest than those for lower speed or data center targeted PMDs. This does not imply a reduction in the need or value of the 40 Gb/s SMF PMD to address the stated applications. Overall costs are minimized through reductions in operational expense (including network design, installation and maintenance) by enabling common modules to be used for 40GE/OC-768/STM-256/OTU3. Carrier SMF is comparable to data center SMF market.