300 Mbps over Copper
VDSSL FTTdp Delivers the Future, Today

WEBINAR | April 2 2014 | Stefan Hirscher
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TO THE POINT - AGENDA

- Business Case
- FIBER-like RATES with VDSL, NOW!
- New Lantiq VINAX™ dp
Most countries have broadband initiatives

EU: At least 50% of European households subscribing to internet connections above 100 Mbps by 2020. The EU aims to turn this ambition into reality.

USA: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 20 megabits per second.

China: The China Daily reported on Sunday, citing broadband speeds in urban and rural households will need to reach 50 Mbps and 12 Mbps by 2020 if they are to close to speeds seen in countries like South Korea.

Germany: Bis zum Jahr 2016 sollen in Deutschland eine flächendeckende Grundversorgung mit mindestens 50 Mbit/s geben. Um mehr Investitions sicherheit für Netzbetreiber im ländlichen Raum zu gewährleisten werden wir die rechtlichen Rahmenbedingungen...
CONSUMER Perspective

100 Mbps+
$30/month
Your Cable Co 😊

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CAPEX per New FTTH Connection

Average FTTH $2000

Source: Operator Data

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CARRIER Perspective: The FTTH Business Case

Need alternative solution if fiber is hard to deploy

Source: Operator Data

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The Solution: Fiber-Like Speeds over Copper with VDSL

ITU-T G.993.2 Annex P
Short reach VDSL2 with enhanced data rate

Distribution Point (dp)
outside customer premises

200 m | 300 Mbps
VDSL2 Profile 30a
dp = distribution point = door, floor, hole, pole, ... wherever

If fiber is hard too deploy, VDSL fiber-extensions from a dp can offer fiber-like speeds, today. 300 Mbps up to 200 meters. Extend fiber over VDSL. No landlord permission required. No local power supply required. CPE subscriber self-installed. Standard compliant ITU-T G.993.2 Annex P

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If fiber is hard to deploy, VDSL fiber-extensions from a dp can offer fiber-like speeds, today. 300 Mbps up to 200 meters. Extend fiber over VDSL. No landlord permission required. No local power supply required. CPE subscriber self-installed. Standard compliant ITU-T G.993.2 Annex P
MARKET: VDSL FTTdp Single-Port

VDSL FTTdp to accompany 5% - 30% of FTTH outside of China and Japan

Source: Lantiq.
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- FIBER-like RATES with VDSL, NOW!

- New Lantiq VINAX™ dp
Lantiq GPON-VDSL FTTdp Solution

VDSL
- VINAX™ V3
- Field-proven (millions of lines)
- Carrier-grade IOP

GPON
- FALC™ ON
- Field-proven (millions of ONTs)
- Lowest Power

End-to-End OPTION
- Complete Gateway/IAD Solutions
- VDSL Profile 30a
- WiFi ac Router
TIME-to-MARKET
LANTIQ FTTdp GPON/VDSL Solution - Connecting Subscribers TODAY! - Reverse powered 200/50 Mbps

READY for VOLUME DEPLOYMENTS

- OEMs, ODMs, Field Trials
- Verified GPON-DSL GMII/VLAN Interface
- Integrated DSL device driver into GPON SoC
- Completed OMCI DSL management entity
- Working e-2-e traffic from OLT to CPE
- Passed EMI and Protection tests
- No DSL performance impact from reverse power
- IOP, IOP, IOP ...
CARRIER GRADE IOP from OLT to WLAN

Lantiq FTTdp Solution

VINAX™ DFE
13x17 mm

VINAX™ AFE
13x17 mm

FALC™-ON D
13x17 mm

BIDI/BOSA

DC/DC

Profile 30a
Up to 300 Mbps aggregate

Gateway Platform

VDSL Phy

Gateway Processor

Reverse Power Feeder

AC/DC

OLT

GPON

BBF 247

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GPON IOP

GPON BBF 247 Certified
Guaranteed IOP 80%+ OLT installed base

- Alcatel-Lucent 7330 ISAM FTTN
- Alcatel-Lucent 7342 FTTU
- Dasan V5812G Pizzabox (2x)
- Ericsson BLM1500
- FiberHome AN5516
- Huawei MA5600
- MT2 OLT Emulator (2x)
- NSN Dasan hiD6615 (2x)
- NSN hix5750 (2x)
- Occam BLC 6322 Pizzabox
- ZTE ZXA10 C220
- …

*Source: Infonetics Broadband Aggregation Equipment Report, December 2013
**FALC™ ON: Highly integrated, power efficient GPON SoC**

1. **BOSA only!**
2. **Integrated laser driver**
3. **Optical Power Management**

<table>
<thead>
<tr>
<th></th>
<th>FALC™ ON</th>
<th>Competition</th>
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<tr>
<td>Optical Power - Burst</td>
<td>350mW</td>
<td>750mW</td>
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<tr>
<td>Optical Power - Idle</td>
<td>50mW</td>
<td>650mW</td>
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<tr>
<td>Optical Ave Consumption / day</td>
<td>1.5Wh</td>
<td>15.7Wh</td>
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<tr>
<td>Optical Ave Consumption / year</td>
<td>~ 550Wh</td>
<td>~ 5,700Wh</td>
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<tr>
<td><strong>1 Million Boxes, Optical Power / year</strong></td>
<td><strong>0.55GWh</strong></td>
<td><strong>5.7GWh</strong></td>
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Lantiq VINAX™ Extremely Compact Footprint

Lantiq

- Lantiq PON 17x17 mm
- Lantiq DFE 17x17 mm
- Lantiq AFE 13x13 mm

Competitor A

- 3rd party PON
- DFE 19x19 mm
- AFE/LD 12x12 mm

and extra MCU and Memory

Competitor B

- PON 23x23 mm
- DFE 17x17 mm
- AFE 17x17 mm

Lantiq VINAX™ Extremely Compact Footprint
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VINAX™ dp
Dedicated FTTdp VDSL Solution

- Compatible with current generation VINAX™ V3
- 40% power reduction from current generation
- 2-pair bonding capable (for reach extension)
VINAX™ dp Power Reduction

today

4.4 Watt*

Vinax™ V3 → Vinax™ dp power reduction

July 2014

2.7 Watt* -- profile 30a

2.3 Watt* -- profile 17a

* VDSL DFE+AFE+LD single-channel mode

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Throughput Lantiq VINAX™ - Profile 30a

Payload Rate* / Mbps

Schedule

- **Today in the lab**
  - Up to 340 Mbps
  - Aggregate net rate without ReTX

- **Today engineering code**
  - DS 200 Mbps ReTX
  - US 50 Mbps IFEC

- **July engineering code**
  - DS 200 Mbps ReTX
  - US 50+ Mbps ReTX

- **2H2014 engineering code**
  - DS 200 Mbps ReTX
  - US 100 Mbps ReTX

* Payload net-rate is the user data-rate between PMS-TC and TPS-TC (u, β reference point), i.e. includes coding and framing overhead, but not the 64/65-TC overhead, measurement with standardized band-plan and nominal target margin (6dB). CO System: VINAX™ V3 Reference Platform (Lantiq test board, comparable to commercial MDUs), Profile 30a, PSD/Bandplan: ITU-T 993.2 Annex B 990A0E30 M2x NUS0 A, IFEC mode, no interleaving (fast), US/DS target margin 6dB. CPE System: Lantiq VRX Reference Platform (Lantiq CPE reference design). Loop Simulator: Spirent DLS8234. Traffic Generator/Analyzer: SmartBits 6000

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Protect Your Invest

G.FAST

New PHY. Same FTTdp
Same GPON. Same CPE Platform
Lantiq - At the Heart of the FTTdp Eco System

- **Apply for Free Carrier Conference Pass**
  Fixed Access Summit April 9/10, Berlin with VDSL FTTdp Demo

- **Apply for a live demo**
  at our regional offices or your site

- **Get in Contact with the right OEM or ODM Partner**

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THANK YOU!

First to Market VDSL FTTdp

Leader in CO and CPE

Learn more on http://www.lantiq.com/fttdp or https://www.youtube.com/user/LantiqChannel