



xDSL current status and future development

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Main drivers influencing the technology and platform strategy

1. Market & customer demand

- Low purchasing power and high telco/GDP spend,
- Low Internet and PC penetration,
- Relatively small market size,
- High price sensitivity (residential especially)
- Continuous decrease of fixed telecommunication services usage,
- Customer requirements:
 - Simplicity and ease-of-use,
 - Quality services at acceptable price levels,
 - Broadband services with speed and quality of connection,
 - Possibility to make choice,
- Liberalized fixed-voice market since 2005
- Unpredictable future regulatory moves in the Internet (bylaws)



2. Competitive trends

- Limited market size makes aggressive entry of new competitors unlikely,
- MT main competitors prove to be ISPs, mobile, CATV operators increasing the threat from substitution
- Broadband competition is expected to increase further through CATV providers and Broadband Wireless Access offers
- Voice over IP and other new technologies (e.g. Broadband Wireless Access) are expected to attack portion of MT voice revenues



3. *Regulatory – legal obligations*

- ❑ Providing Interconnection technical, financial and legal conditions for network operators, in the MATERIO approved by the Agency at 23th Jan 2006.
- ❑ Providing Local Loop Unbundling technical, financial and legal conditions for network operators, in the MATERUO approved by the Agency at 28th April 2006.
- ❑ Providing Network Access commercial conditions for the VoIP service providers via ISDN for international outgoing calls provisioning



3. Technology trends

- Development of technologies and networks compatible with or forming part of Next Generation Network
- Provisioning of wide range of services with main focus on broadband services
- Provisioning of high quality services with continuously improving operational and maintenance efficiency
- Cost-effective technical solutions
- corporate services and applications
- Triple-play





Major product characteristics & developments

products

xDSL

characteristics & developments

- Ethernet based DSLAMs
- Focus on ADSL2+, VDSL

SDH/PDH

- Upgrade with Ethernet interfaces;
- Replacement of certain PDH with SDH

IP/MPLS

- Gb Ethernet in the core,
- QoS

Copper
infrastructure

- Utilization of spare capacities only +replacement of old cables (duct).
- Implementation of optical cables as close as possible

products

F/O infrastructure

Ethernet

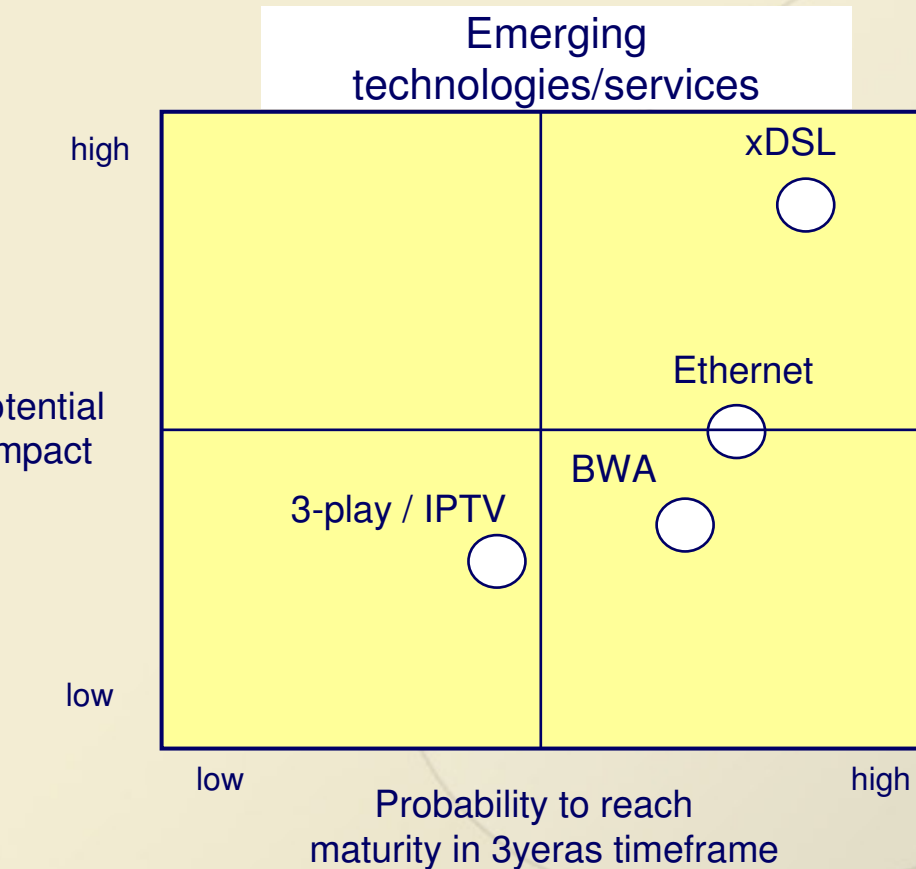
WDM

characteristics & developments

- Backbone: 1200km (ring topology)- Future extensions to prepare for mesh topology, provide additional capacities
- Urban in all bigger cities – deployment towards user end-points
- Extend footprint of current MEN
- Building nation-wide Ethernet network for broadband residential services will enable easier and less costly expansion of nation-wide corporate Ethernet services.
- The lack of spare capacities in optical cables could initiate implementation of DWDM on the backbone level and CWDM on local level

Emerging technologies and their potential impact





- xDSL - Accelerated geographical roll-out of DSLAMs/Access GWs accompanied by last mile redesign will create conditions for country-wide broadband availability
- BWA - as a complement to landline ADSL broadband access and as backhaul solution
- Ethernet - Offered to business customers to satisfy their emerging needs for high bandwidth connectivity at or beyond 2Mbit/s; In the core for metro data traffic consolidation
- Triple play



ADSL



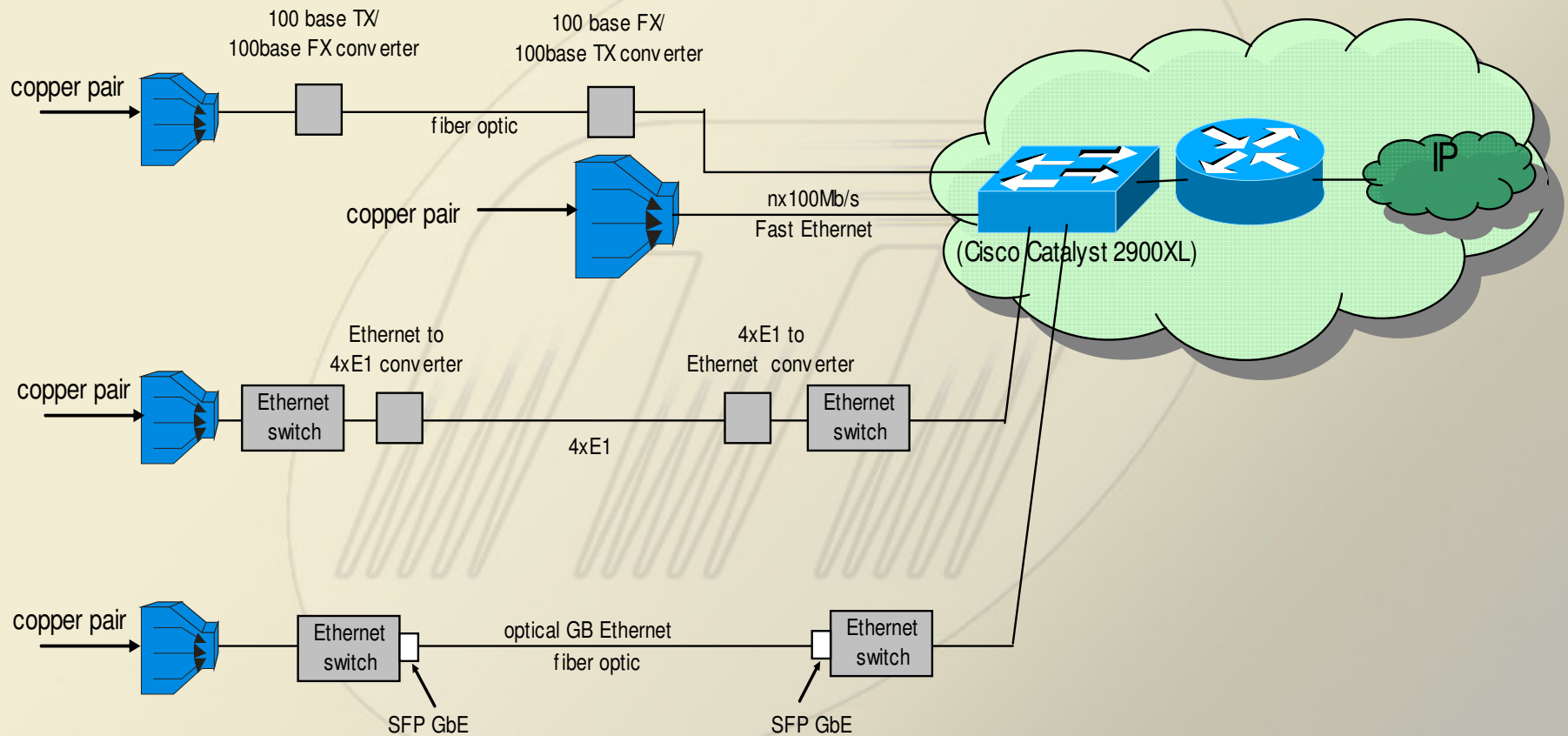
The services offered

- Fast internet access,
- WS ADSL
- Video surveillance

<i>packages</i>	<i>Kbps</i>	<i>Included monthly traffic (upload and download)</i>
HIT	<i>384/128</i>	<i>512 MB</i>
START	<i>512/128</i>	<i>512 MB</i>
MAX	<i>512/128</i>	<i>4 GB</i>
MINI OFFICE	<i>768/128</i>	<i>2 GB</i>
OFFICE	<i>1024/256</i>	<i>10 GB</i>
PROFI	<i>1536/256</i>	<i>25 GB</i>



Connection to the existing IP Network

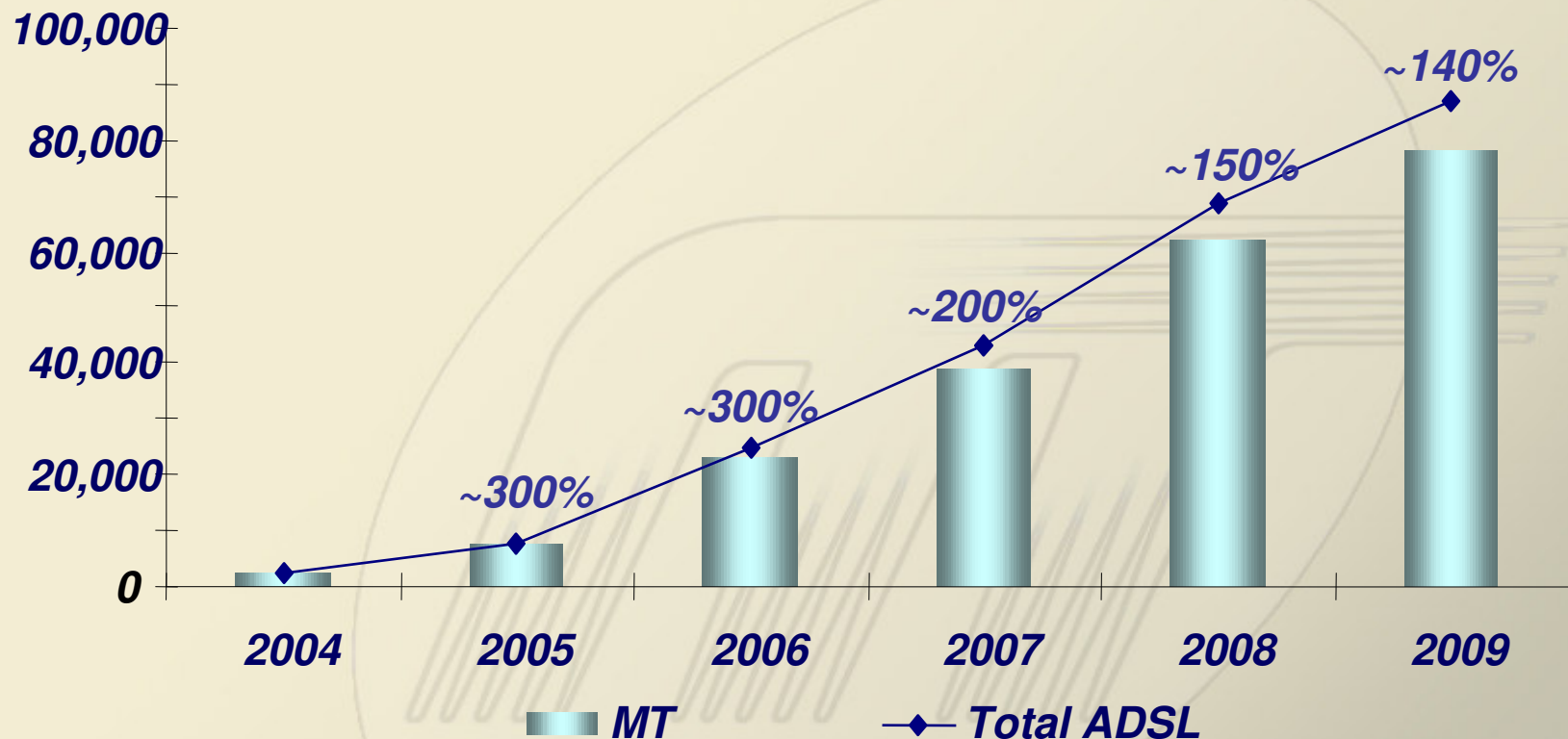


ADSL aggregation network

<i>Current status</i>	<i>Optical Ethernet</i>	<i>Electrical Ethernet</i>	<i>PDH/SDH</i>	<i>Total</i>
<i>% of DSLAMs</i>	<i>30,11%</i>	<i>8,52%</i>	<i>61,36%</i>	<i>100%</i>
<i>% of ADSL lines</i>	<i>30,66%</i>	<i>50,25%</i>	<i>19,08%</i>	<i>100%</i>



Growth projection



Structure:

31% residential customers

9% business customers

CAGR: ~200%

- Expected MT ADSL Internet market share in the next three years ~ 89% (wholesale ADSL included)
- A high ADSL access base creates a platform for future media businesses/IPTV development



ADSL – Short / mid term positioning

- ***Most important consideration driving ADSL2+ migration is introduction of triple-play services.***
- ***Bandwidth requirements in the local loop imposed by triple-play end-users can only be met by a powerful broadband technology such as ADSL2+ / VDSL***
- ***In the long-term, access network development will be increasingly directed from xDSL-based technology towards FTTx.***
- ***For providing higher bandwidth, links in the ADSL aggregation network should be migrated to optical Ethernet wherever possible.***



Conclusion and key ideas

1

Service offers of the future are high “consumers” of bandwidth.

Broadband is therefore a fast growing market, where DSL is today the dominant technology.

2

In MT, BB penetration although low is growing fast.

Strong push is being done on network coverage.

3

MT’s BB strategy covers both the network and the service areas.

On the network domain special focus is being made on the access network deploying DSL, F/O, Ethernet and IP/MPLS, as a major BB enabling technologies