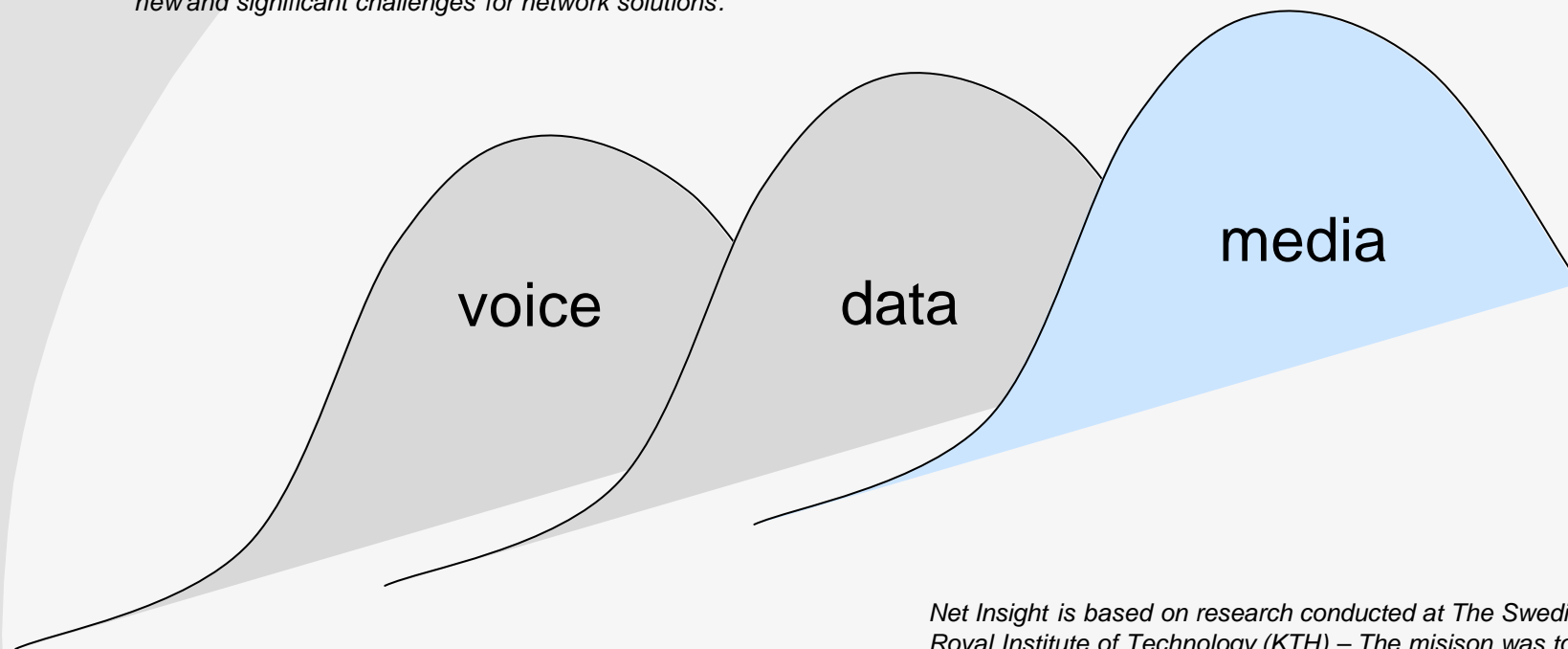real-time
streaming
media
STUDIO
PRODUCTIO

Media Networking

Per Lindgren,
VP Business Development
per.lindgren@netinsight.net
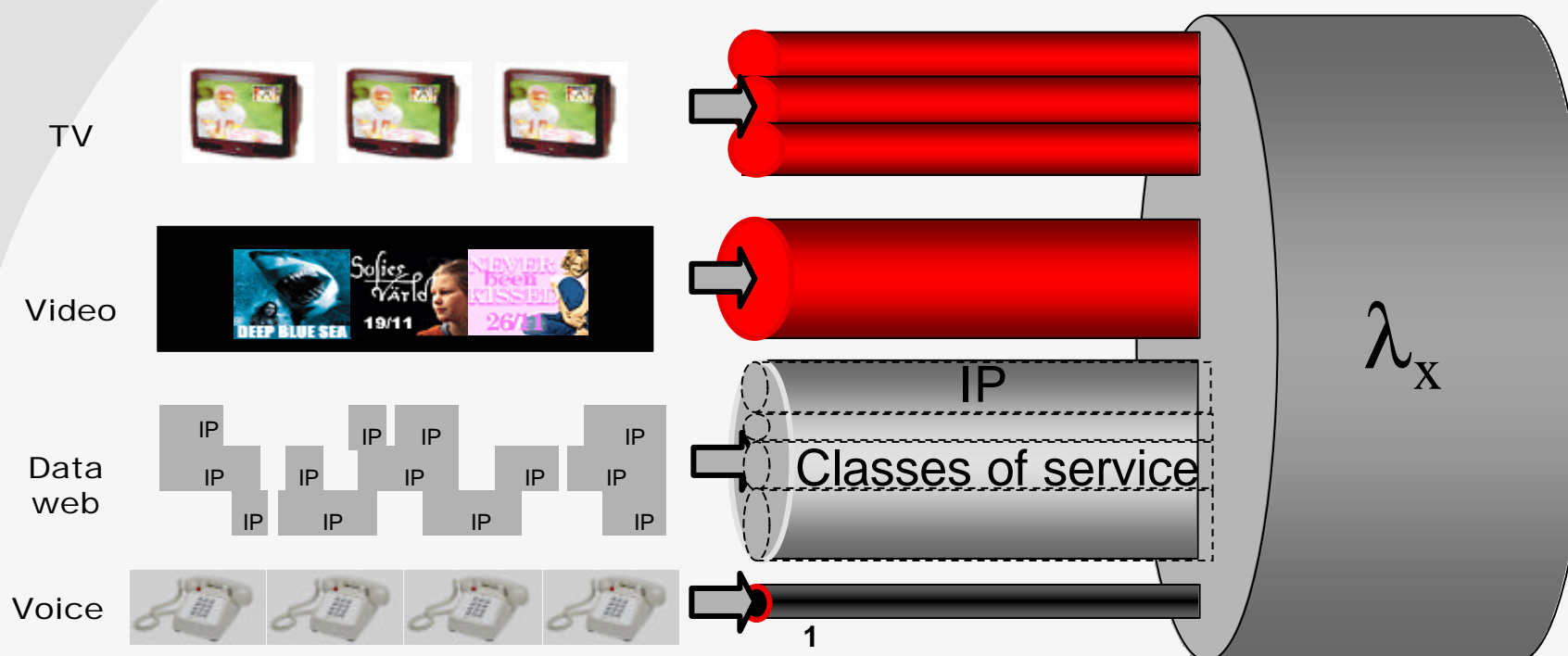
net insight™

The vision is the challenge

Our vision is that the need for video and other real time sensitive media will grow rapidly in the future. This poses new and significant challenges for network solutions.

media

voice

data

Net Insight is based on research conducted at The Swedish Royal Institute of Technology (KTH) – The misison was to find the solutions for next generation, media rich, networking. The research was partly sponsored by Ericsson and Telia.

Multiservice with 100% QoS at full network load

Resource management in optical
domain ensures service separation

TV

Video

λ_x

IP

Classes of service

Data
web

IP   IP   IP   IP
IP   IP   IP   IP   IP
IP   IP   IP   IP

Voice

1

- Service separation ensures 100% QoS
- Service separation ensures high utilization

1. **Market Trends and Network Development**

- Media networks
- Satellite benchmarking

Video/Media market expansion - Win-Win

B2B media contribution

Content Delivery Networks (CDN)

B2C Content Distribution Networks

Operators

End customer need today

Large investments made in optical infrastructure

- need revenue generating traffic to fill it

New market segment opportunity with high growth and short RoI

Media customers

Complement costly satellite transport

Higher quality in production and reduced production time

Benchmarking US media Pricing

Satellite pricing: 32 Mbps satellite connection
                       $200 000/month

Point-to-point: 32 Mbps occasional production
                       $6000/month   N.Y. – D.C
                       $70 000/month   L.A. – N.Y.

Net Insight's solution in combination with the low cost of fibre
capacity makes it possible to price a service at 50 % of above
prices and still have payback in less than 12 months.

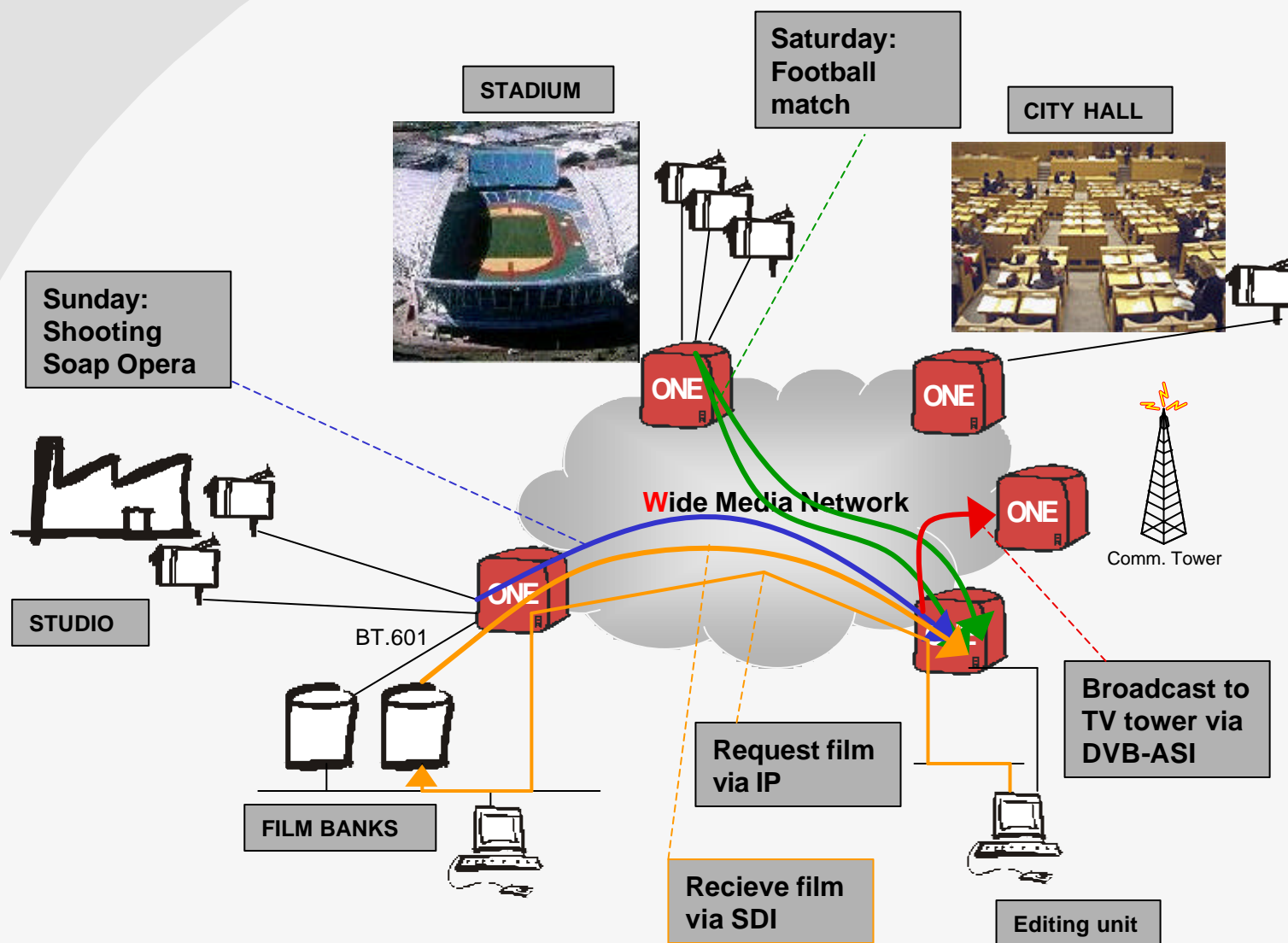# 2. **Professional Media and Entertainment industry**

Media networking (streaming)

- Services: SDI/SDTI/ASI/GigE

- Media applications

- CATV/CDN distribution

Services enabled

- High speed real time streaming services with 100 % QoS,
- Occaisionally, scheduled or permanent service
  - Services:
    - SDI 270 Mbps Streaming
    - DVB-ASI 0,5-220 Mbps Streaming
    - IP MPEG Streaming
    - Lan to Lan
    - Voice VPN's
- Multicast or broadcast of video streams
- Up to eight uncompressed SDI streams/OC-48

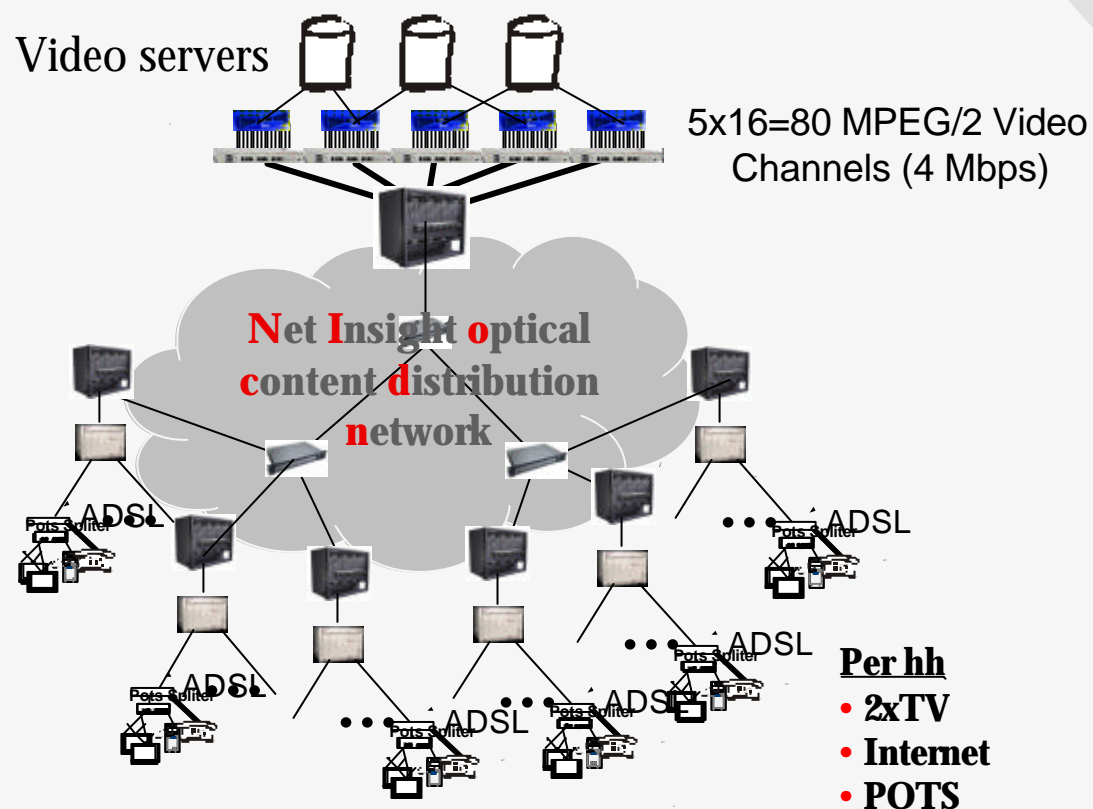# 3. Service offering example - Video production

TV distribution network using xDSL

Today's problems:
- QoS problems
- Overprovisioning
- Handling multicast
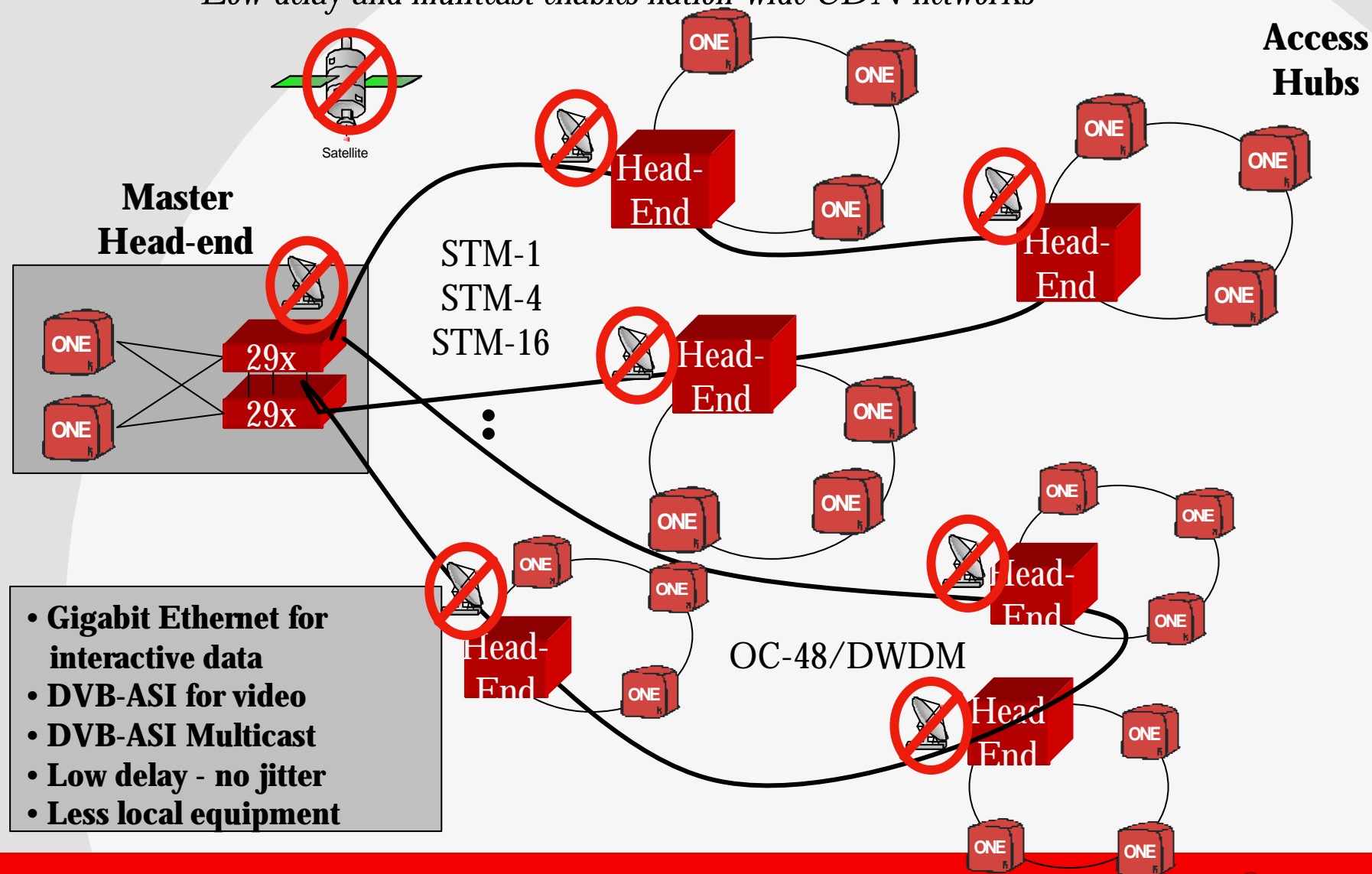- Offer dynamic services
- VoD
- Interactivity

Net Insight's solution:
- 100% QoS for all services
- Ethernet/IP Multicast
- High reliability
- High utilization
- Secure IP service for all users
- On-demand service support
- SLA support with QoS
- Billing support
- Real-time interactivity

Video servers

5x16=80 MPEG/2 Video Channels (4 Mbps)

Net Insight optical content distribution network

ADSL
Pots Splitter

ADSL
Pots Splitter

ADSL
Pots Splitter

ADSL
Pots Splitter

ADSL
Pots Splitter

ADSL
Pots Splitter

Per hh
- 2xTV
- Internet
- POTS

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National content distribution networks

Low delay and mulitcast enables nation-wide CDN networks

Access Hubs

Satellite

ONE
ONE
ONE
ONE
ONE
ONE
ONE
ONE

Master Head-end

ONE
ONE

29x
29x

Head-End

STM-1
STM-4
STM-16

Head-End

Head-End

Head-End

ONE
ONE
ONE
ONE
ONE

- **Gigabit Ethernet for interactive data**
- **DVB-ASI for video**
- **DVB-ASI Multicast**
- **Low delay - no jitter**
- **Less local equipment**

Head-End

ONE
ONE

OC-48/DWDM

Head-End

Head-End

ONE
ONE
ONE
ONE
ONE

ONE
ONE

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3. Media networking requirements

- Reliability - Redundancy
- Guaranteed QoS - Real-time
- On-demand delivery
- High capacity

over existing infrastructure

Telecom and Media do not talk

- Access interfaces often telecom, not media oriented

- Reliability is key!!!

- High end video today not economically feasible

- Store and forward of large files has to be combined with live real-time streaming - in the same infrastructure!

- Provisioning often very static

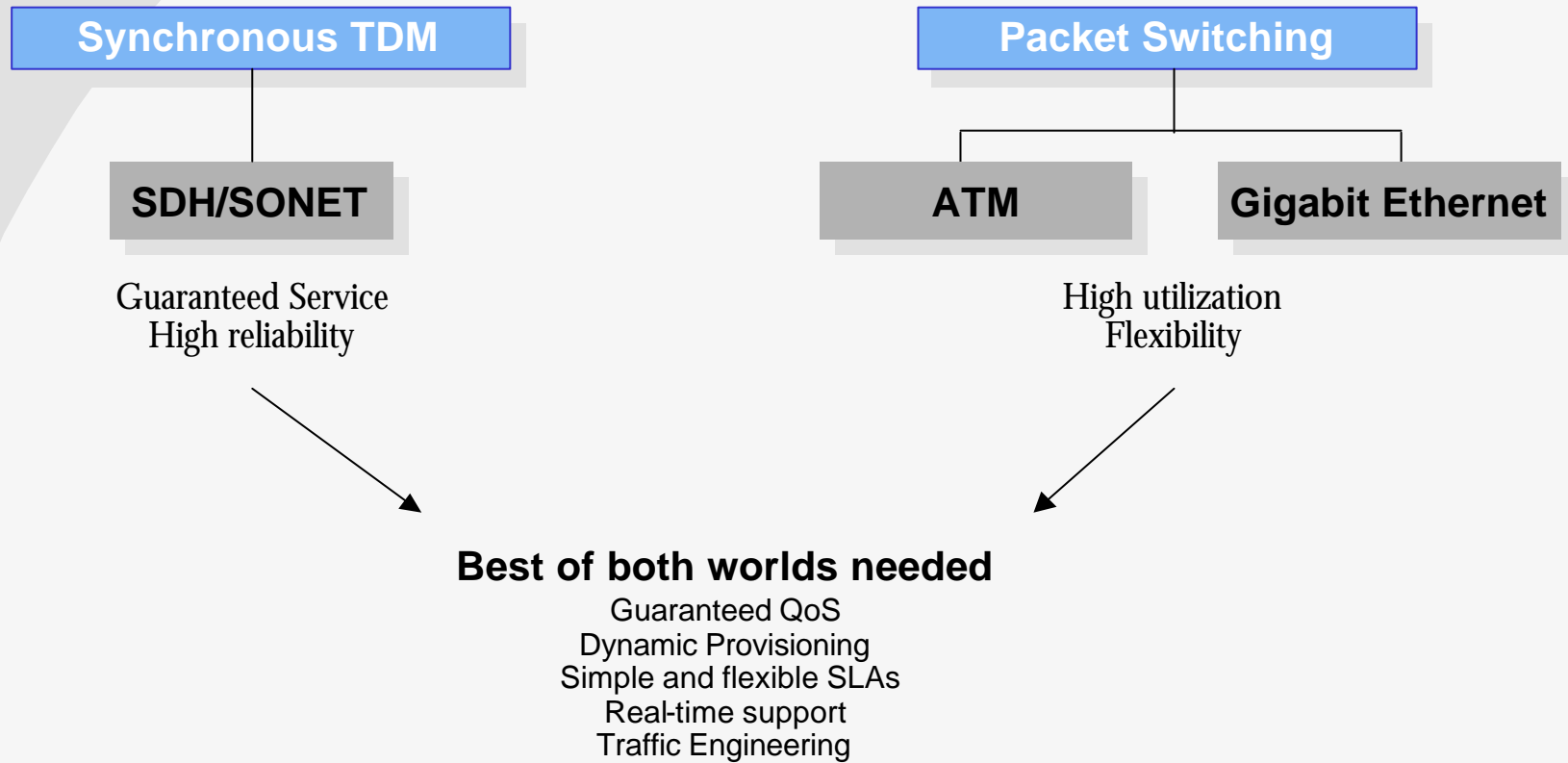- Problems with jitter/wander and delay over existing networks

Customer acknowledgement

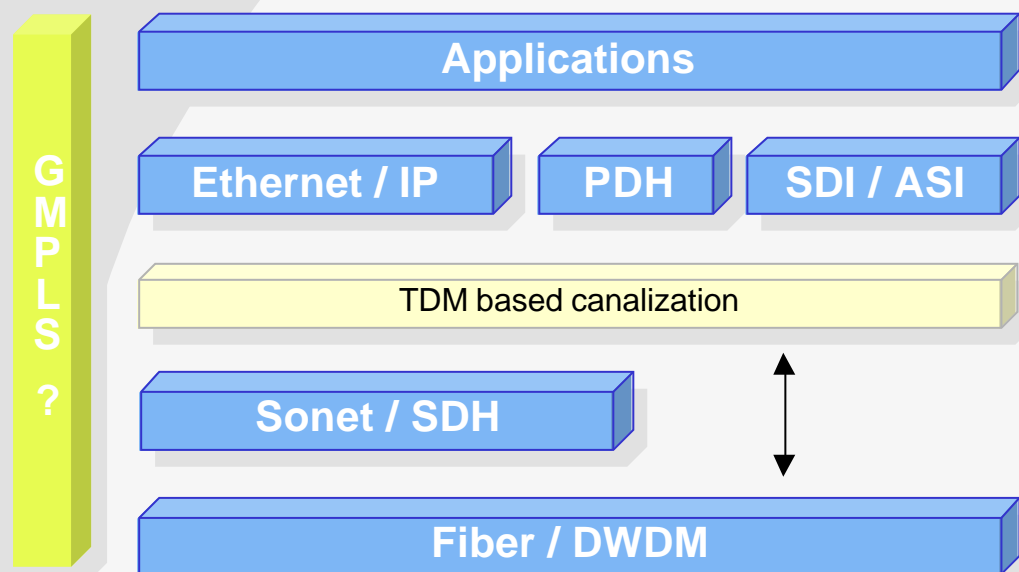"MPEG transport over IP or ATM is simply not the ideal outcome - they are not suited to this application".

"This is why we are so excited about DTM which is designed for this sort of high-value simplex, synchronous traffic"

Andy Setos, Executive Vice President of the News Technology Group, Fox Television. TV Technology Magazine, Sept. 5, 2001

Broadband networking of today

Synchronous TDM		**Packet Switching**

SDH/SONET	**ATM**	**Gigabit Ethernet**

Guaranteed Service
High reliability

High utilization
Flexibility

Best of both worlds needed
Guaranteed QoS
Dynamic Provisioning
Simple and flexible SLAs
Real-time support
Traffic Engineering

Our vision of next generation optical networking

G M P L S ?

Applications

Ethernet / IP   **PDH**   **SDI / ASI**

TDM based canalization

Sonet / SDH

Fiber / DWDM

- IP is already <u>the</u> general purpose service interface

- Ethernet will be <u>the</u> datacom interface

- SDI, SDTI, ASI and Gigabit Ethernet are <u>the</u> media interfaces

- Sonet/SDH is the legacy transport technology for fibre based networks ⇒ DWDM transport

- TDM based canalisation enable **100% QoS, provisioning and SLA (billing**) support for both streaming and datacom services

Conclusion

- Era of media and telecommunications convergence - win-win situation

- Operators need new services for competitive edge

- Media companies can rationalize production and create new business

- Streaming - a killer application to current networks

- DTM - First optical standard for effective resource management over DWDM - March 01

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