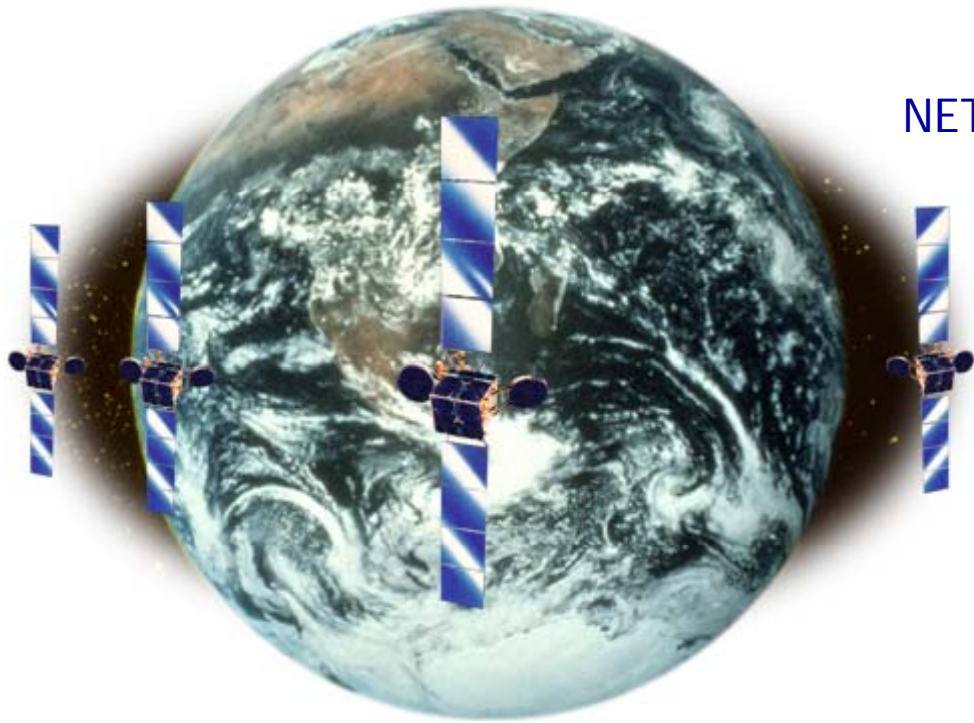


# Expanding the Eurovision Network with fibre, using Dynamic Transfer Mode (DTM)

*NET working?* Broadcast Networks and their security  
16 and 17 June 2004



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# 1. How unilateral traffic is moving from Satellite to Fibre in Europe

# Building fibre routes



- ✓ The growth of the Internet led to massive investment in building fibre routes
- ✓ From 1995 to 2000, capacity in Europe grew twenty-fold
- ✓ Demand was over-estimated

# A threat for unilateral traffic

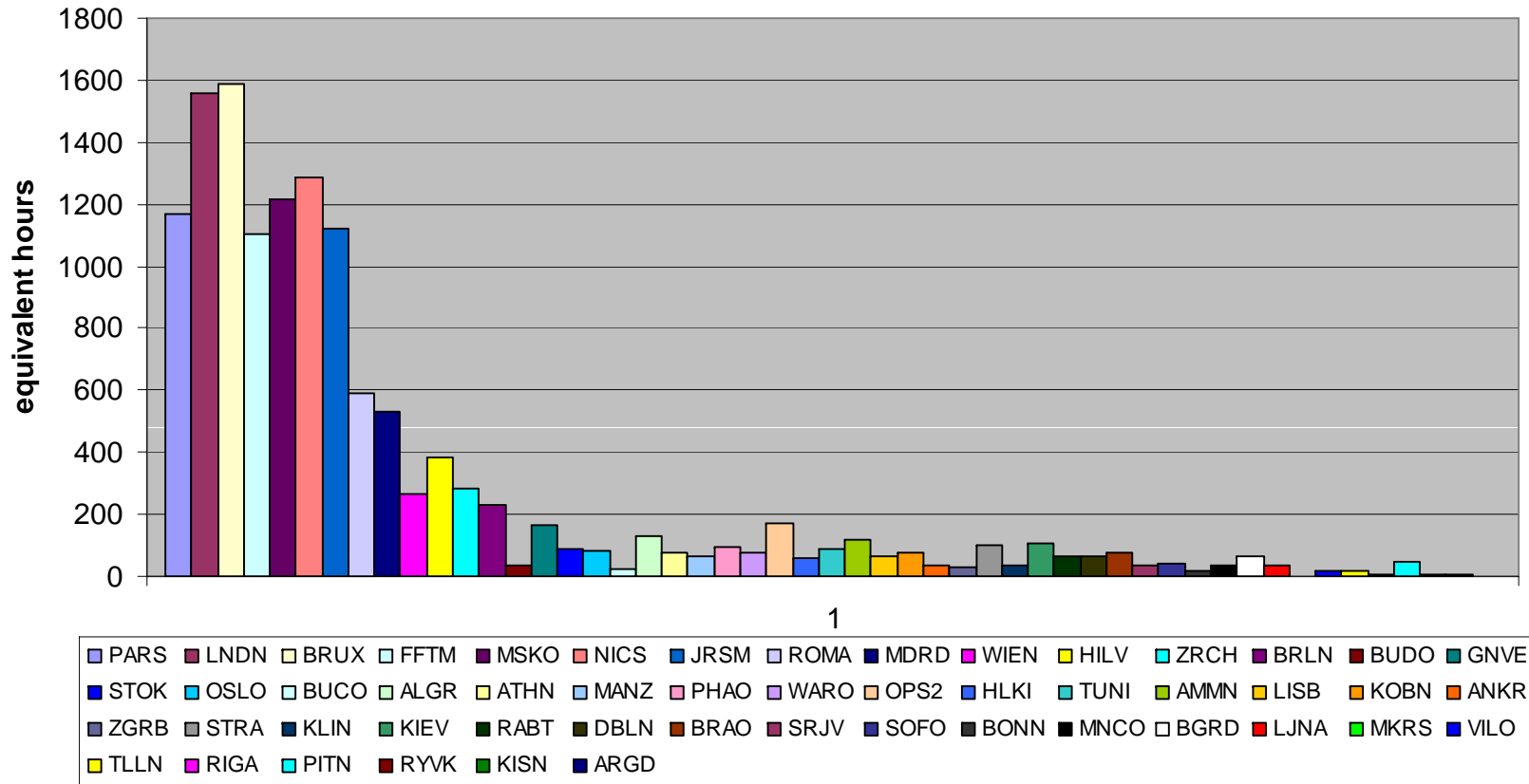
- ✓ EBU members are starting to take up low-cost offers for fibre connections from international carriers

*however*

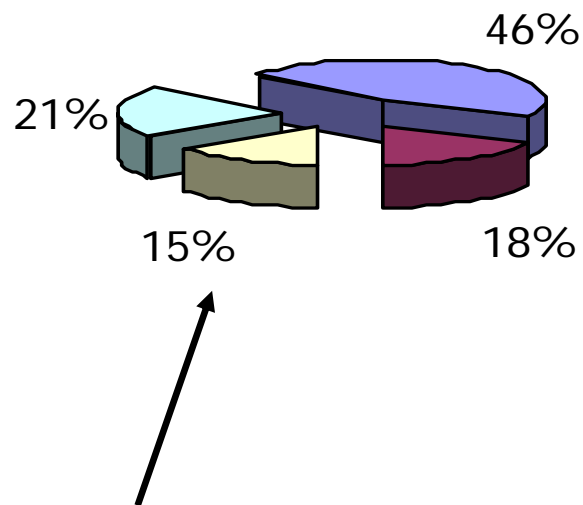
- ✓ For multi-lateral transmissions, fibre is inadequate today
- ✓ Only « big » routes are ready

# Where is the traffic ?

unilateral traffic 2001



# Where is the traffic ?

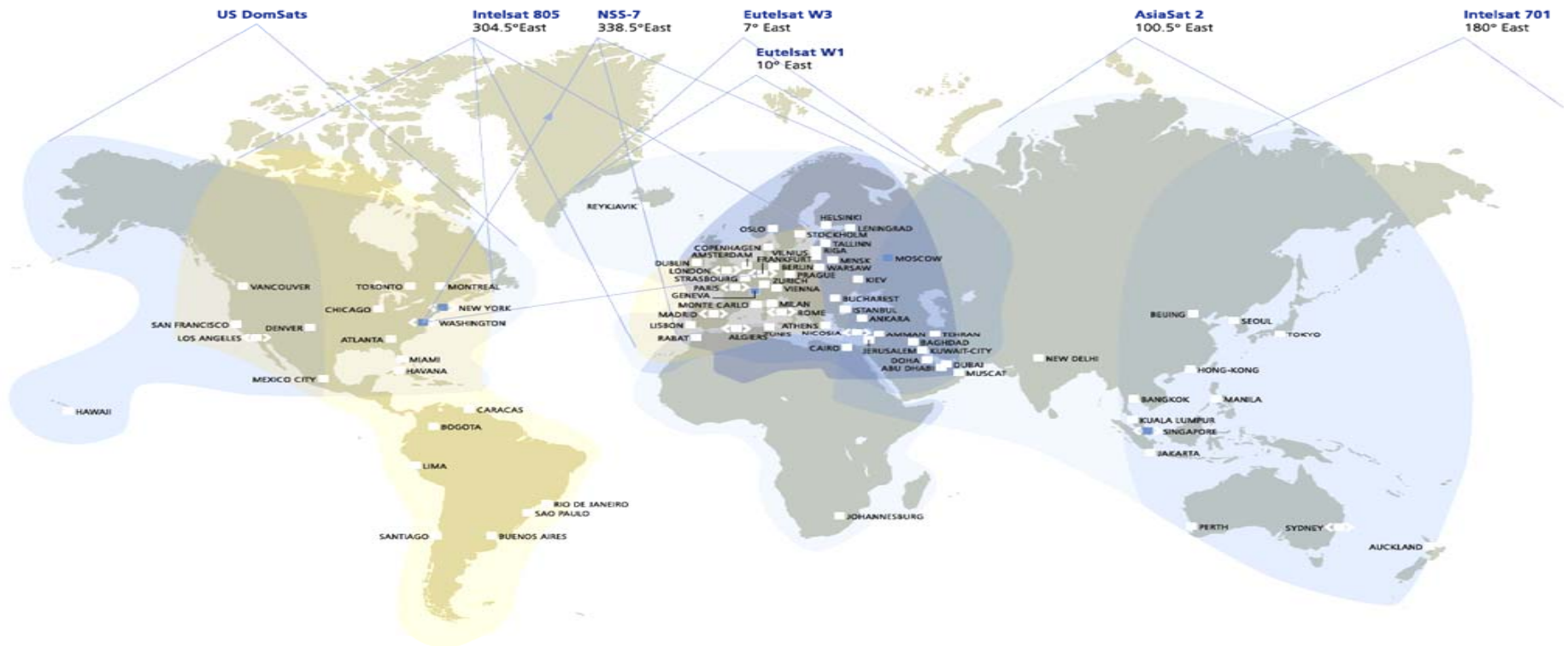


This traffic could be transported on fibre

- Multilaterals
- Transportables
- Selected 9 uplinks and 20 downlinks
- Remainder

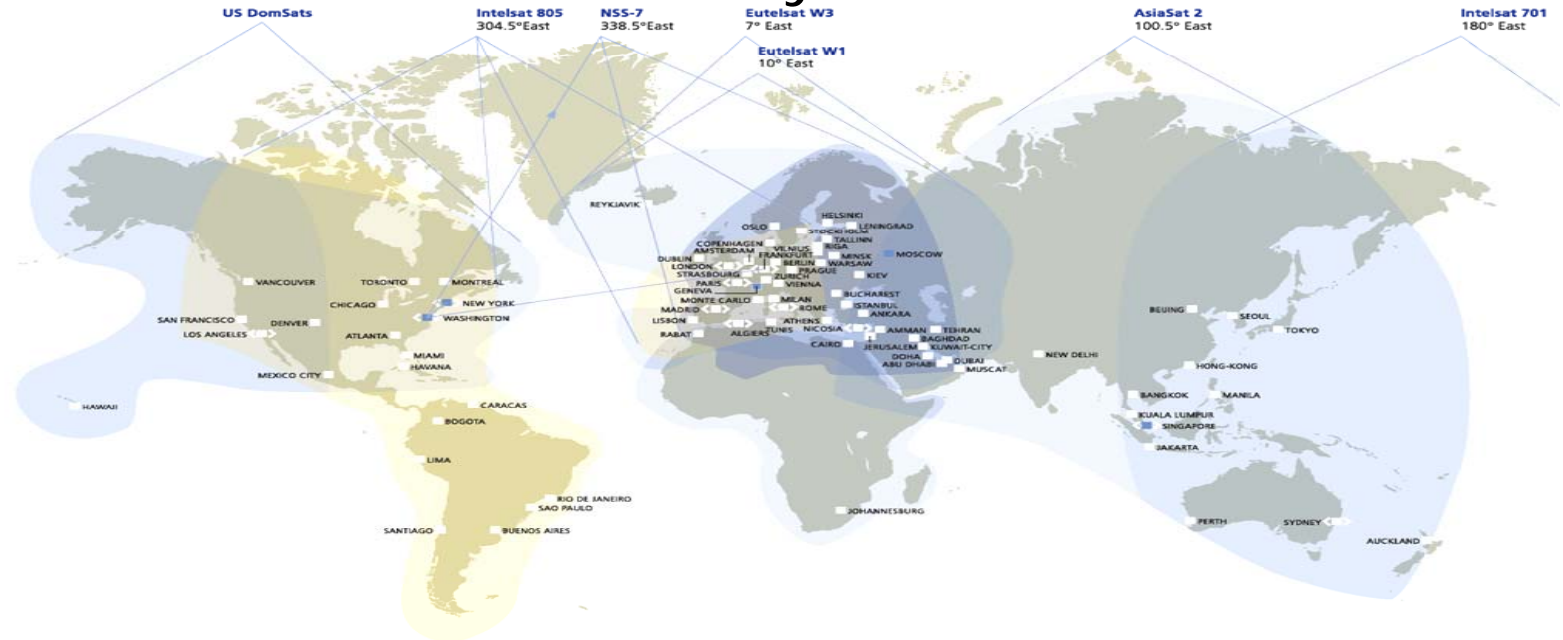
# 2. The fibre trial (July 02-July 03)

## How to use fibre for Eurovision ?



# The current Eurovision network

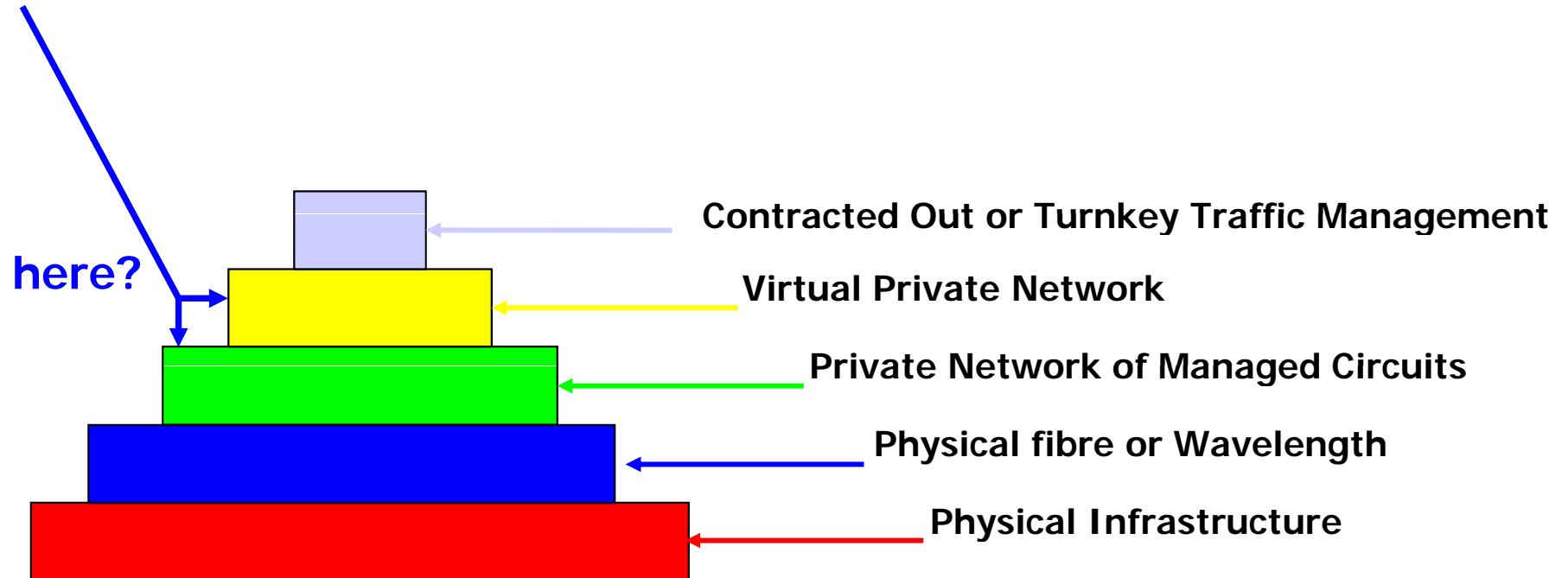
- ✓ 100% satellite
- ✓ European and Transatlantic coverage
- ✓ Dedicated to Broadcasters only





# Two possibilities for Eurovision

## EBU Optimum Position



# Which technology ?

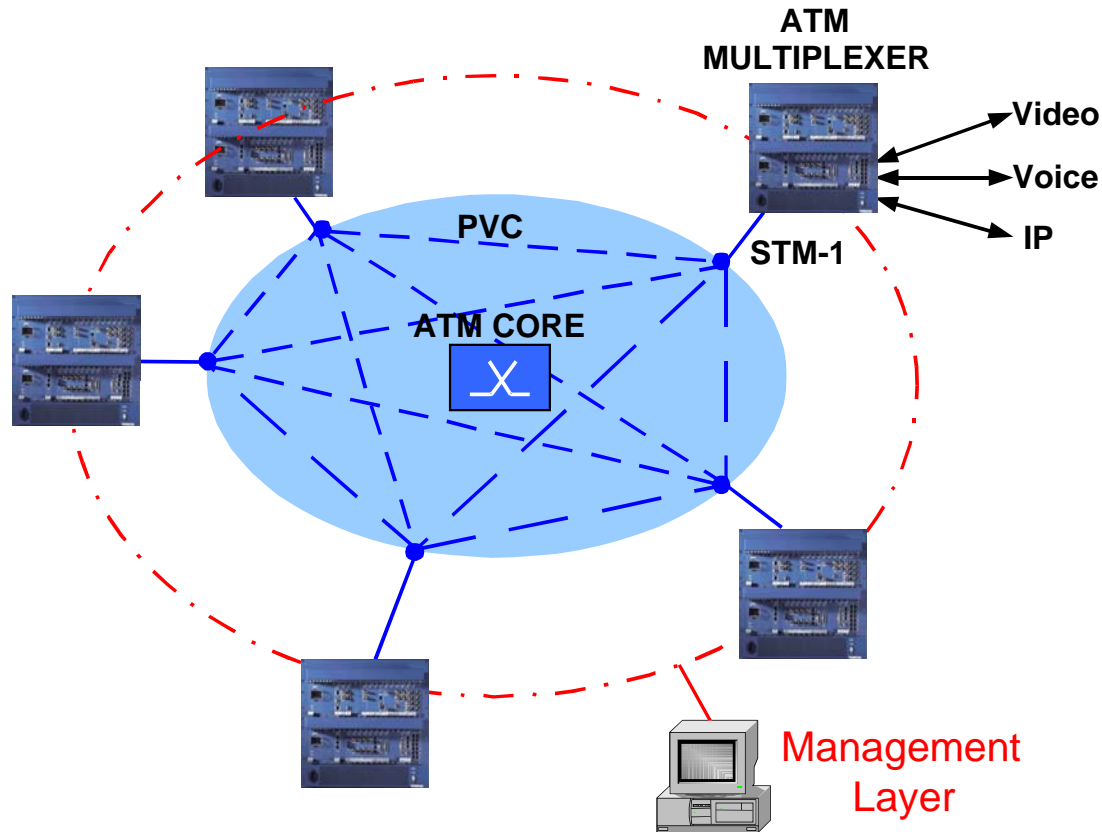
Several technologies are available:

- ATM: Most widely used approach. The standard for telephony networks.
- IP/MPLS: Technology pushed by the Internet. Not primarily designed for real-time applications
- DTM: Seeks to overcome risks of packet-based systems. Developed by NetInsight.

# The fibre trial (July 2002 / July 2003)

- Decision was taken in July 2002 to investigate fibre technologies for Eurovision.
- Several solutions were investigated:
  - ✓ ATM
  - ✓ Virtual private network MPLS (ATM interface)
  - ✓ Virtual private network MPLS (IP interface)
  - ✓ Private network MPLS
  - ✓ Private network DTM

# ATM



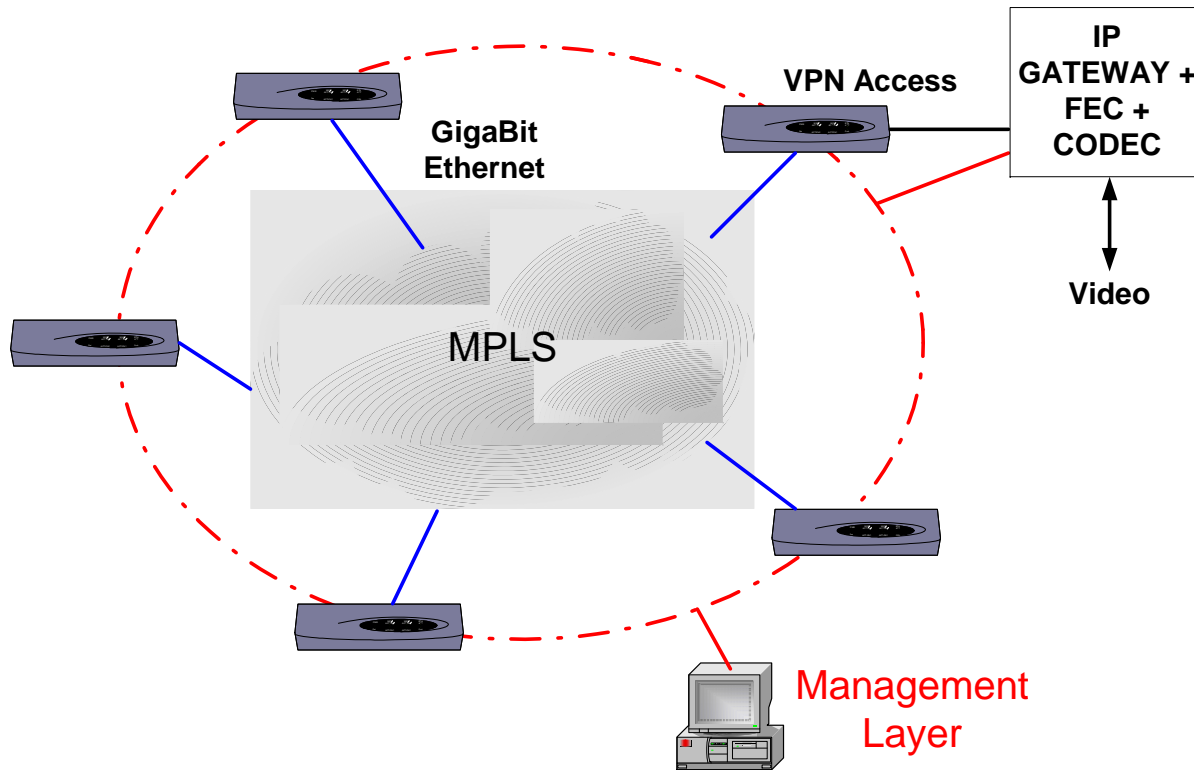
+

- Proven & reliable

-

- Only competitive on existing networks
- Limited flexibility
- Limited reach on international networks

# IP/MPLS shared network (VPN)



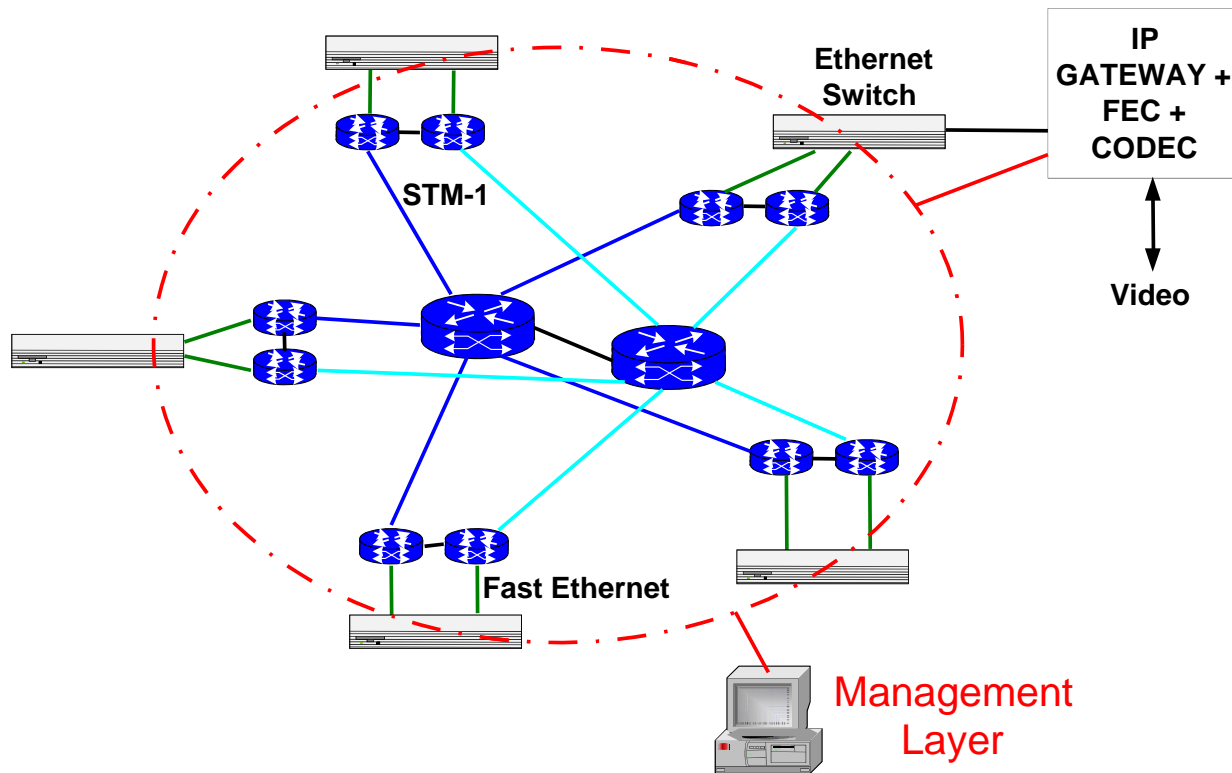
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- Flexible
- Pushed by the market
- Many suppliers

-

- QoS issues for real time applications (video)
- No control on the network

# IP/MPLS dedicated network



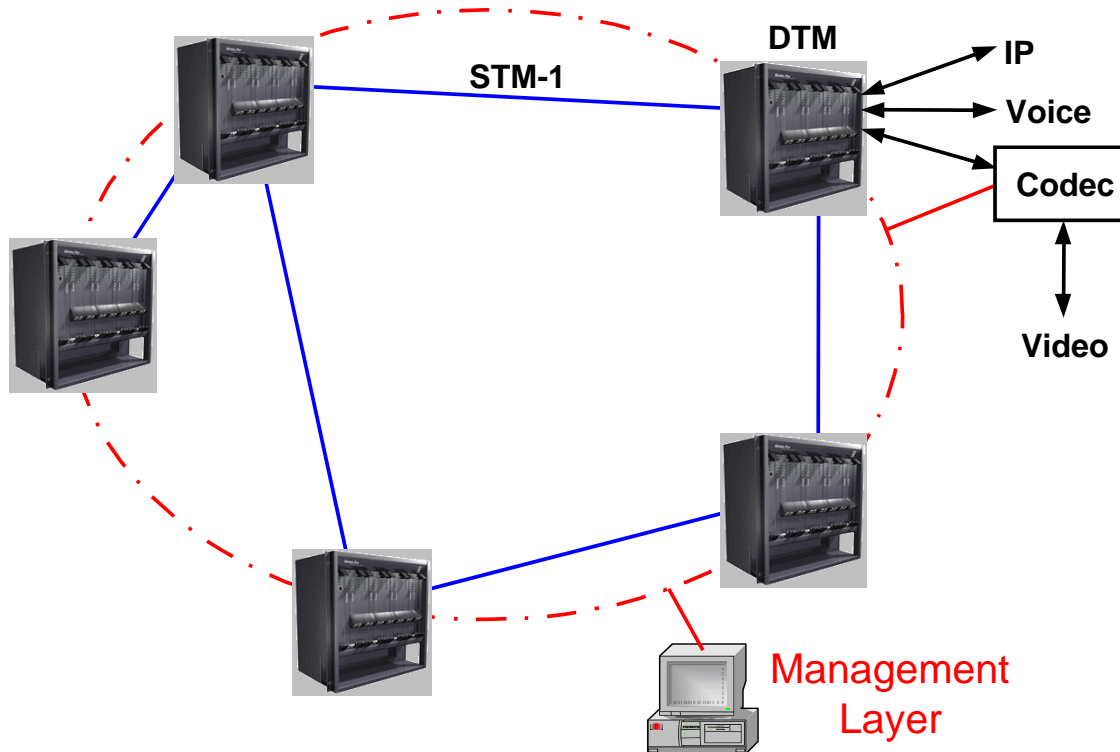
+

- Flexible
- Pushed by the market
- Many suppliers

-

- Expensive
- Complex to manage

# DTM dedicated network



+

Flexible

- Perfect QoS
- Simple to manage

-

- One supplier

# Recommendation/1

- ✓ Solutions based on the use of public networks (VPN) make it difficult to maintain the QoS
  - ✓ Building our own network (using managed lines) is now affordable
- ⇒ Building a private network was recommended



# Recommendation/2

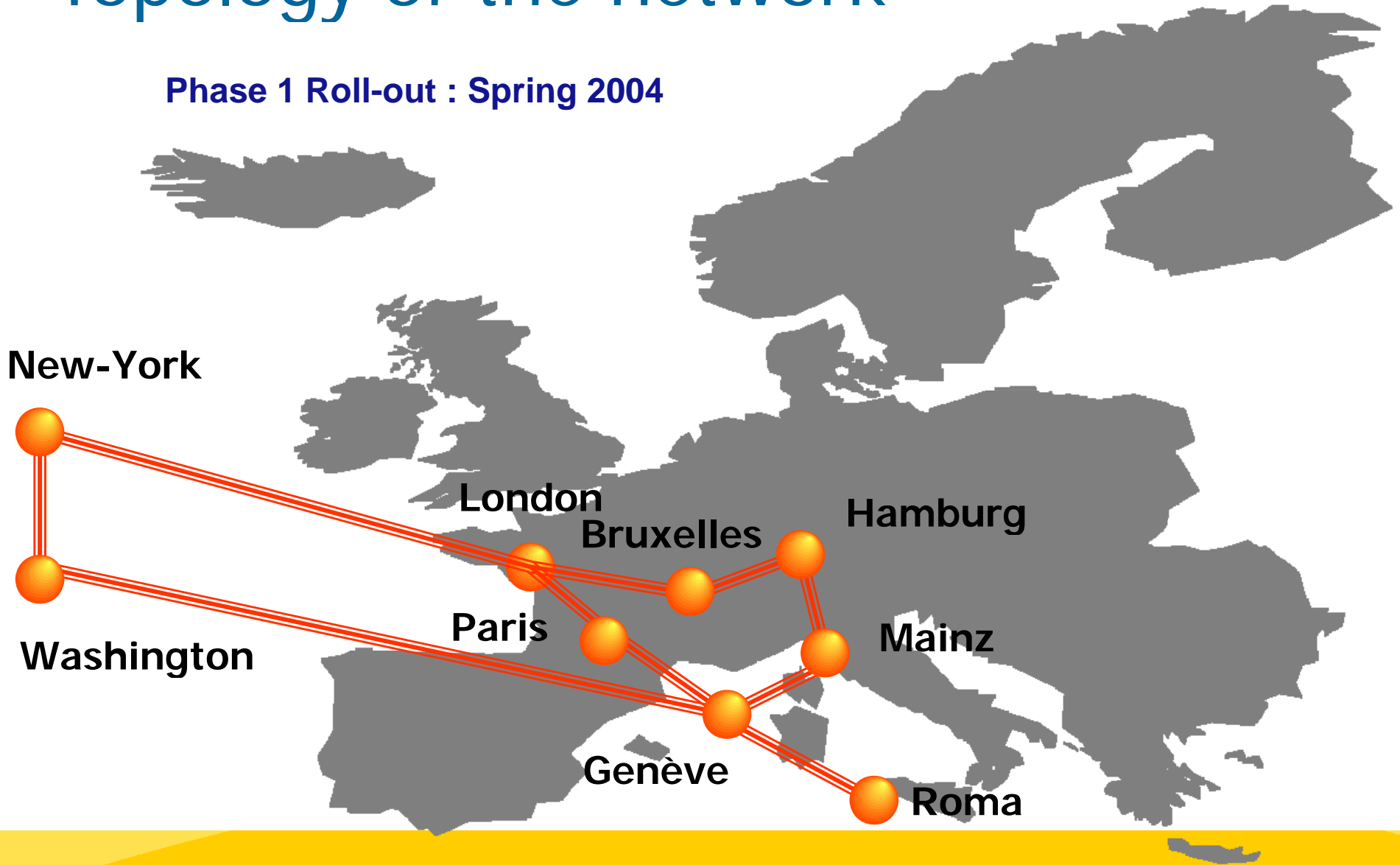
- ✓ Two technologies are competing: IP/MPLS or DTM
  - ✓ DTM better suits our needs and is trusted by our clients
  - ✓ IP/MPLS appears complex and not well-adapted to real time video
- ⇒ DTM was recommended

# **3. The Project**

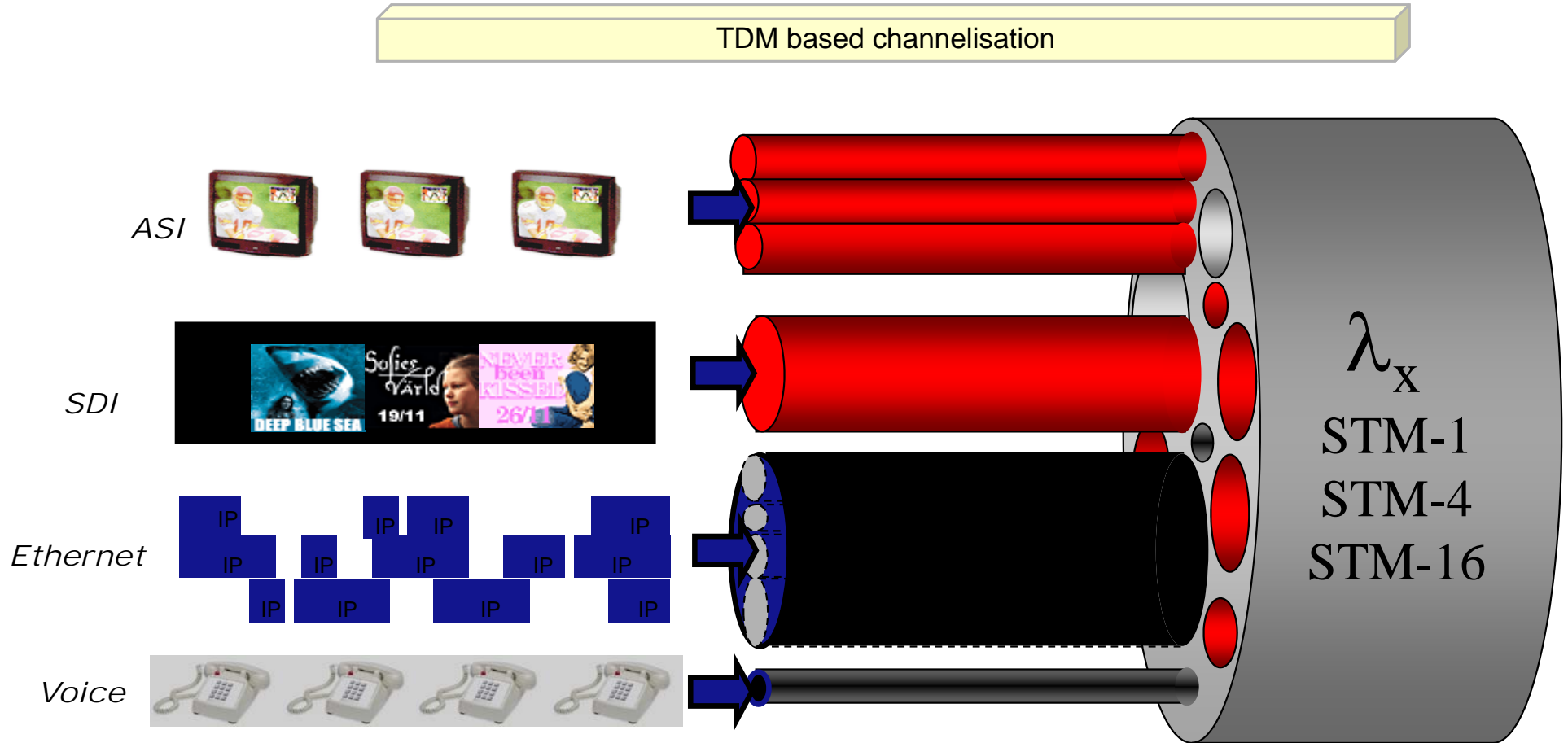
## **Building the Network**

# Topology of the network

Phase 1 Roll-out : Spring 2004



# DTM transport of services



# DTM-The Nimbra platform

## Trunk Interfaces:

Dark Fiber 1Gbps

STM-1 155Mbps

STM-4 622Mbps

STM-16 2,5Gbps



## Service Interfaces:

SDI 270 Mbps, Video

ASI 2-220 Mbps, Video

Ethernet 10/100

Gigabit Ethernet

E1/T1, G.703 service

STM-1 Access

# DTM-Access Interfaces

**Nimbra One**  
CPE chassis for  
7 cards



**Video**



*SDI*



*ASI*

*512 kbps - 213.5 Mbps*

**Voice/G703**



*E1 / T1*

**Ethernet**



*Gigabit  
Ethernet*



*10/100  
Ethernet*

# DTM-Trunk interfaces

## Nimbra One

Chassis for  
7 cards



Dark fiber  
1 Gbps

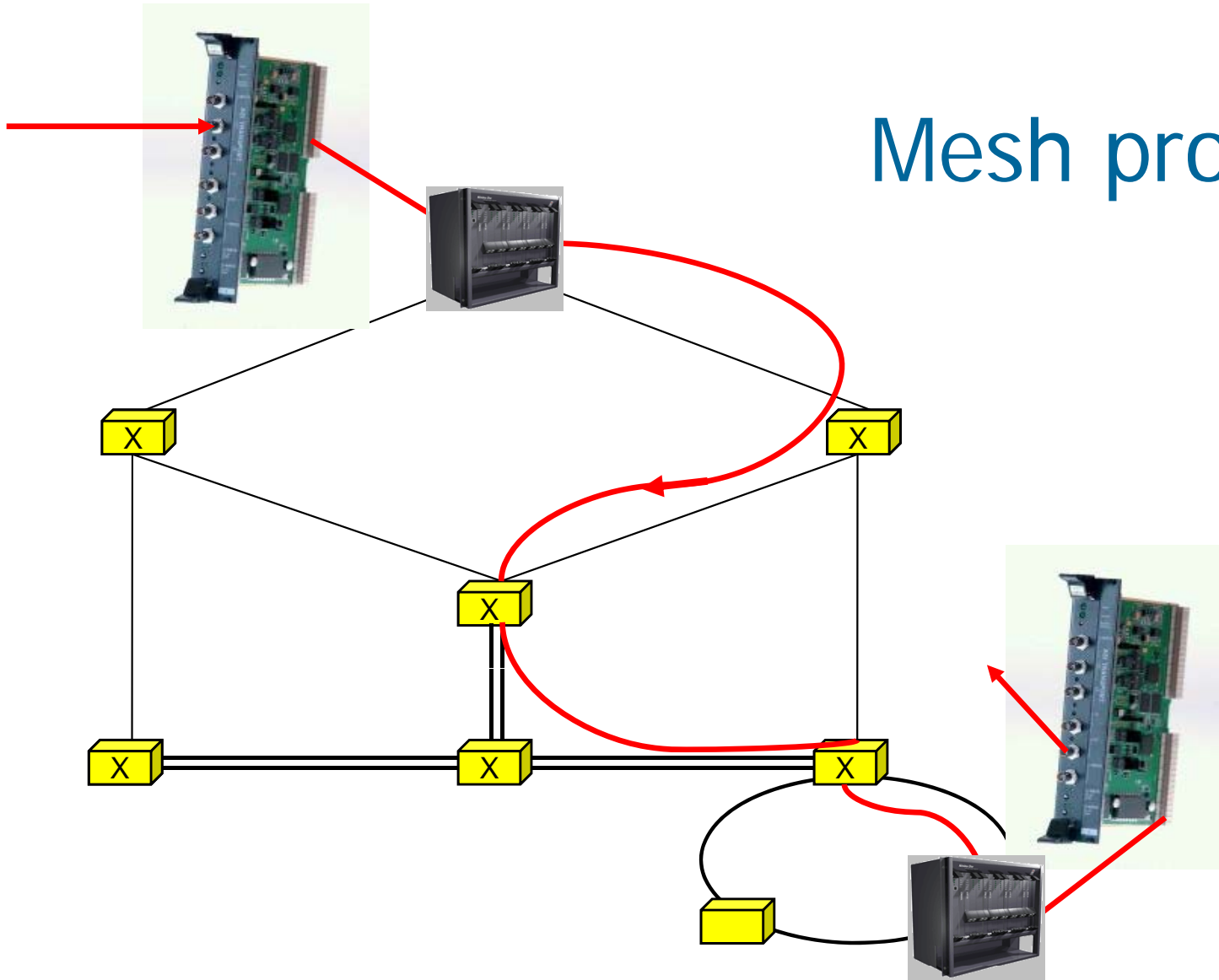


STM-1 / OC-3  
155 Mbps



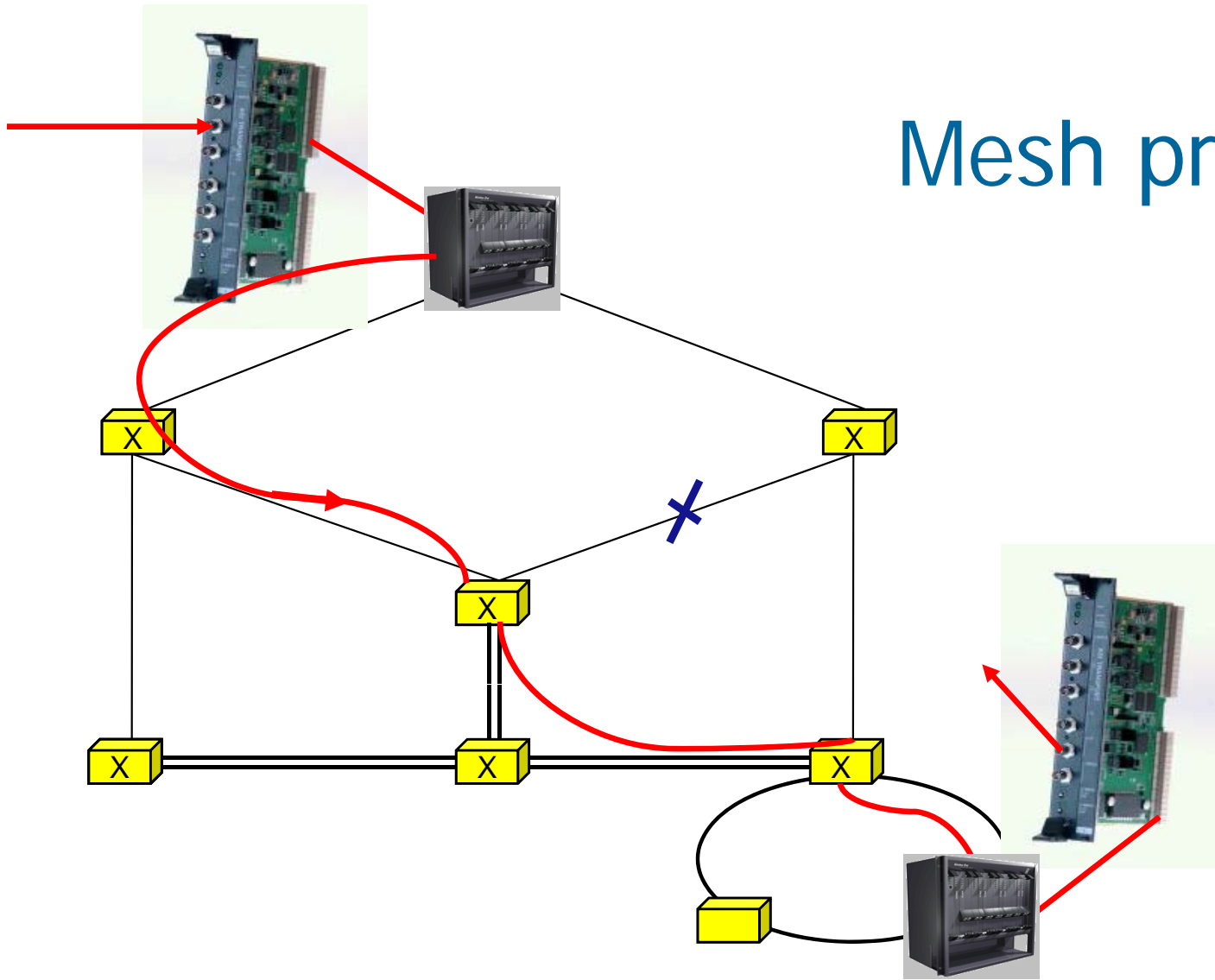
STM-4 / OC-12  
622 Mbps

# Mesh protection





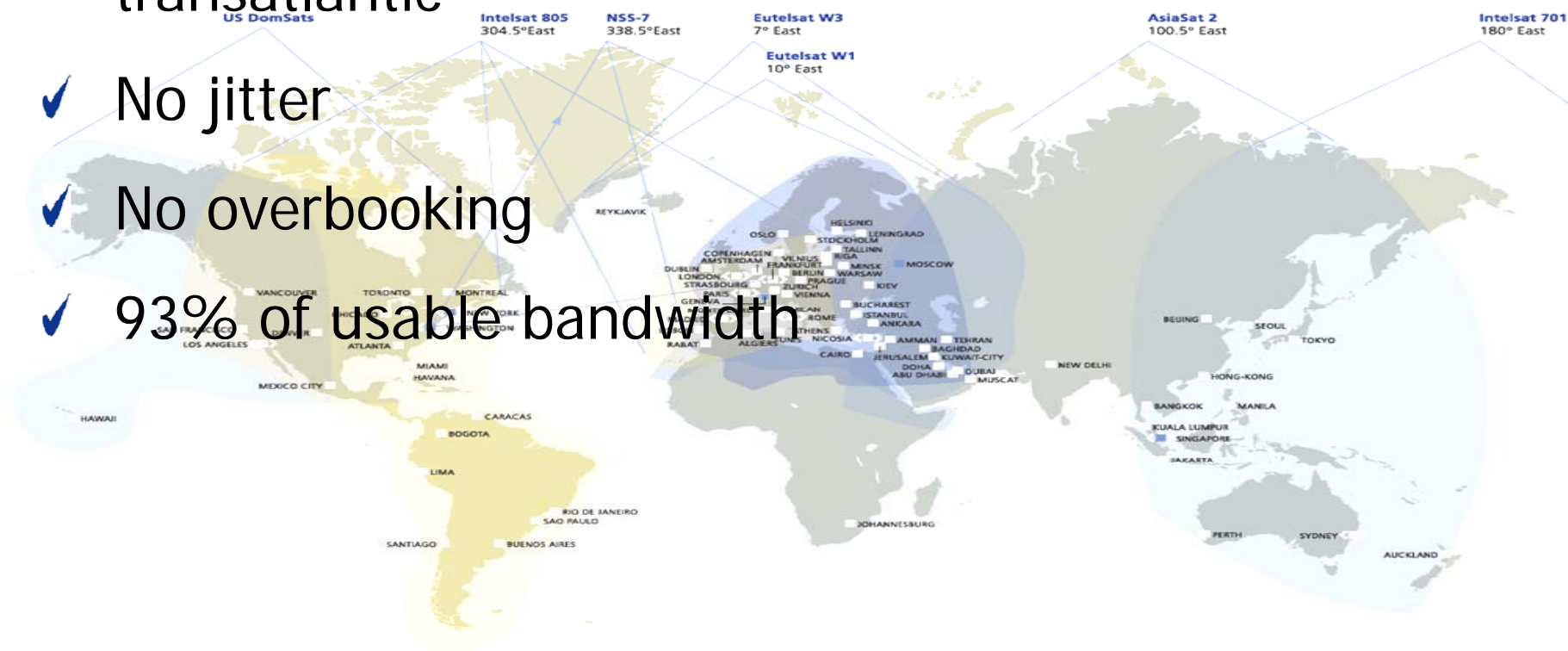
# Mesh protection



# Performance

- ✓ Low latency of the network (without including MPEG encoding) <25ms intra Europe, <60ms transatlantic

- ✓ No jitter
- ✓ No overbooking
- ✓ 93% of usable bandwidth



# Deployment

- ✓ June 2004: permanent connections
- ✓ Summer 2004: On-demand services
- ✓ October 2004: Dial-up connections

