



Projects and Test Beds Related to OBS in Europe

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Introduction

What defines OBS – especially vs. OPS?

- **Assembly of client packets to form larger units**
- **One-pass reservation/tell-and-go**
- **No buffers in the network**
- **Offset-time**
- **Burst-mode transmission**
- **...**

For this presentation

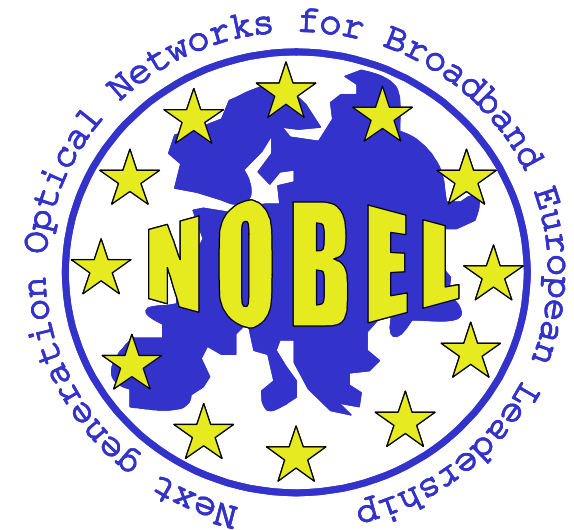
... at least one of the criteria to be satisfied

Disclaimer

- **Project overviews to the best of my knowledge**
- **No projects left out intentionally, more projects likely to exist**

NOBEL

- Integrated Project (IP) in 6th EU framework
- 32 partners from 15 countries
- Ca. 2000 person months in 2004–2005
- Major vendors, carriers and university groups



Key objective

"... to find and to validate experimentally innovative network solutions and technologies for intelligent and flexible optical networks"

OBS/OPS activities

- **Architectures**, concepts and solutions for assuring **end-to-end QoS**
- Novel **control** and **management** functions required for OBS
- Solutions to burst mode **transmission**, lab experiments

LASAGNE

- STReP in 6th EU framework
- 10 partners from 6 countries
- Starting in 2004
- University/research centers and manufacturers

Key objective

"... studying, proposing and validating the use of optical logic gates ... at **metro** network nodes in **all-optical** label-swapping (AOLS) networks"

OBS/OPS activities

- **Design** and **realization** of new optical logic gate architecture for AOLS
- **Demonstration** of an all-optical routing node (read, swap, route)
- Study of **networking aspects** of AOLS: performance, planning, ...
- Innovative **disaster recovery** strategies for OPS networks

STOLAS

- Project in 5th EU framework
- 9 partners from 6 countries
- Ca. 690 person months, 12/2001–11/2004
- University/research centers, manufacturer and carrier



Key objective

"... improve throughput of packet-switched networks by novel optical routing techniques based on **stacked optical labels**" [λ and FSK]

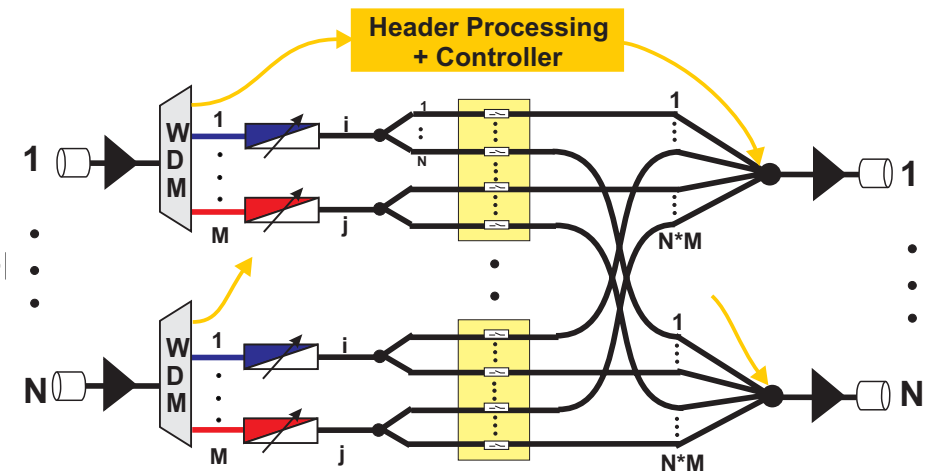
OBS/OPS activities

- Network and AWG node **architectures**
- Network **management** and **control** for QoS support
- Creation of key optical **components**
- **Lab** testbed and small-scale **field trial** with the AWG node



TransiNet

- German government funded
- 5 partners
- 2000–2003
- University/research, 1 operator



OBS activities

- Architectures and concepts
- QoS and contention resolution strategies
- Tune-and-Select (TAS) node based on SOAs and TWCs
- Integrated evaluation of performance and technology



DBORN

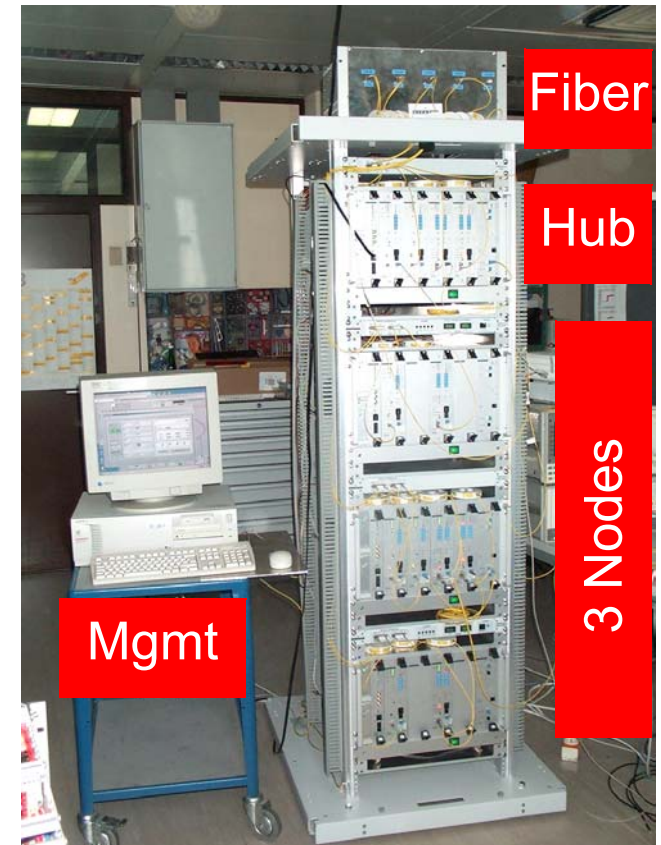
- WDM burst metro ring
- Testbed by Alcatel Research & Innovation
- Related research projects: IST-DAVID, BMBF MultiTeraNet BurstNet

Key objective

"...access nodes with **passive optical design** and an aggregation hub for multi-ring interconnection..."

OBS/OPS activities

- **Architectures**, concepts and solutions for metro networks
- Design and realization of **low-cost** burst-mode transceivers
- Native **Quality of Service** support
- Performance **monitoring** in burst-mode networks



Research Integrating Projects

E-Photon ONe

- **"Network of Excellence" in 6th EU framework**
- **40 partners of 17 countries**
- **Starting early 2004**
- **Integration of European research activities in field of optical networks**
- **Joint research activity includes OBS**



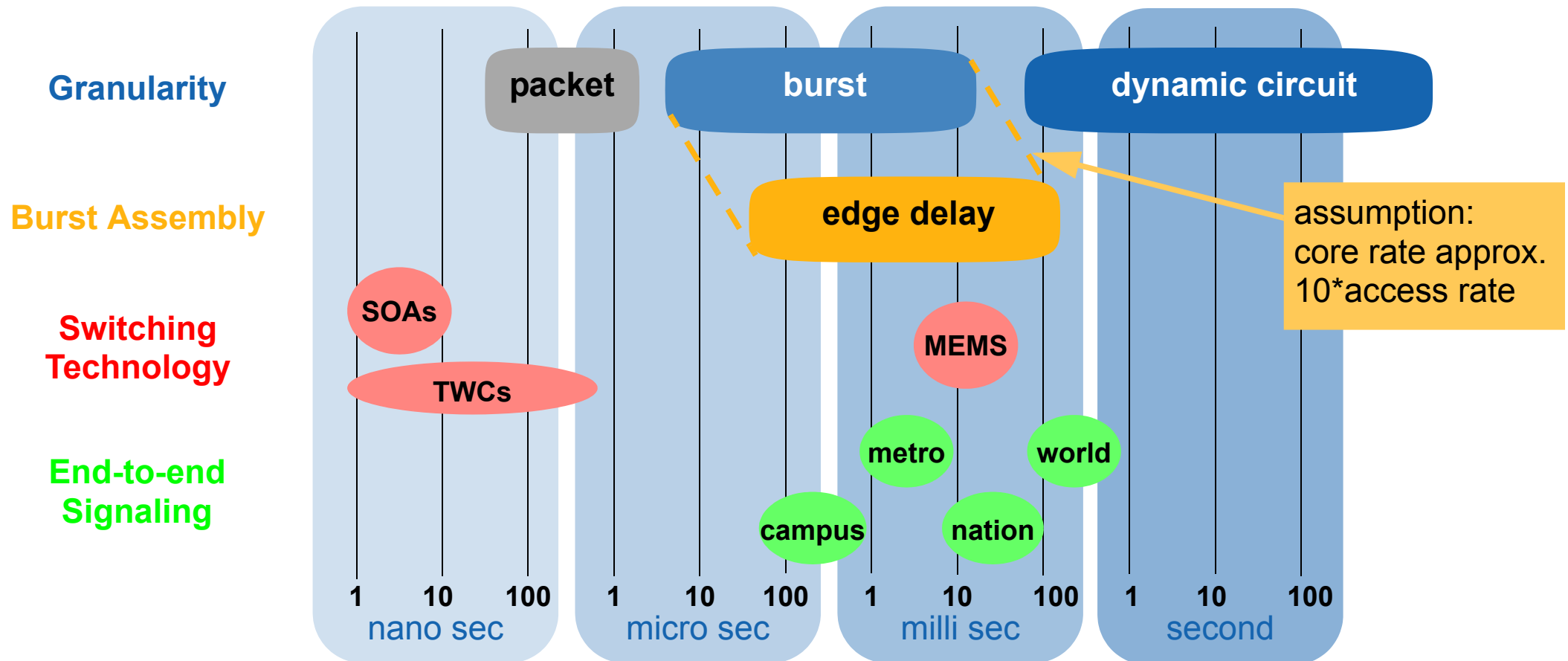
COST Actions

- **EU/European Science Foundation**
- **Action COST 266 had working group on OBS/OPS**
- **15 signatory countries – 20+ groups**
- **Final report available at (in future): sirius.ure.cas.cz/dpt240/cost266/**
- **New action proposed including OBS/OPS activities**





OBS Timing



joint work with H. Buchta, J. Saniter, E. Patzak of HHI Berlin

Future Direction of OBS

...more like **OPS**

... more like **OCS**

typical burst length

short: 10...100 μ s,
some aggregation

long: > 1 ms,
extensive aggregation

burst reservation

one-pass only

one-pass or end-to-end

contention resolution

λ conv., **FDL**, deflection routing

λ conv., defl./alternative routing

...

→ Need for consistent solutions: architecture + technology + control

Summary

- **Topics**

- viability for operators
- metro/core scenario
- technologies
- cost-efficient implementation

- **Considerable effort in**

- EU projects
- national projects

➔ **But downturn of industry has shifted focus significantly**



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Presentation and Links at
www.ikr.uni-stuttgart.de/~gauger/BurstSwitching.html

Thanks to ...

Erik van Breusegem, Walter Cerroni, Gert Eilenberger, Lars Dembeck, Mike O'Mahony, Javier Marti,
Jose Martinez, Fabio Neri, Martin Nord, Erwin Patzak

General IST Links

"Information Society Technologies (IST)" in 6th Framework Project of EU

- **Cordis IST in FP 6 server**

www.cordis.lu/ist/

Thematic Network projects

- **OPTIMIST**

www.ist-optimist.org

- **BREAD**

www.ist-bread.org



Information Society
Technologies

European Projects Contact

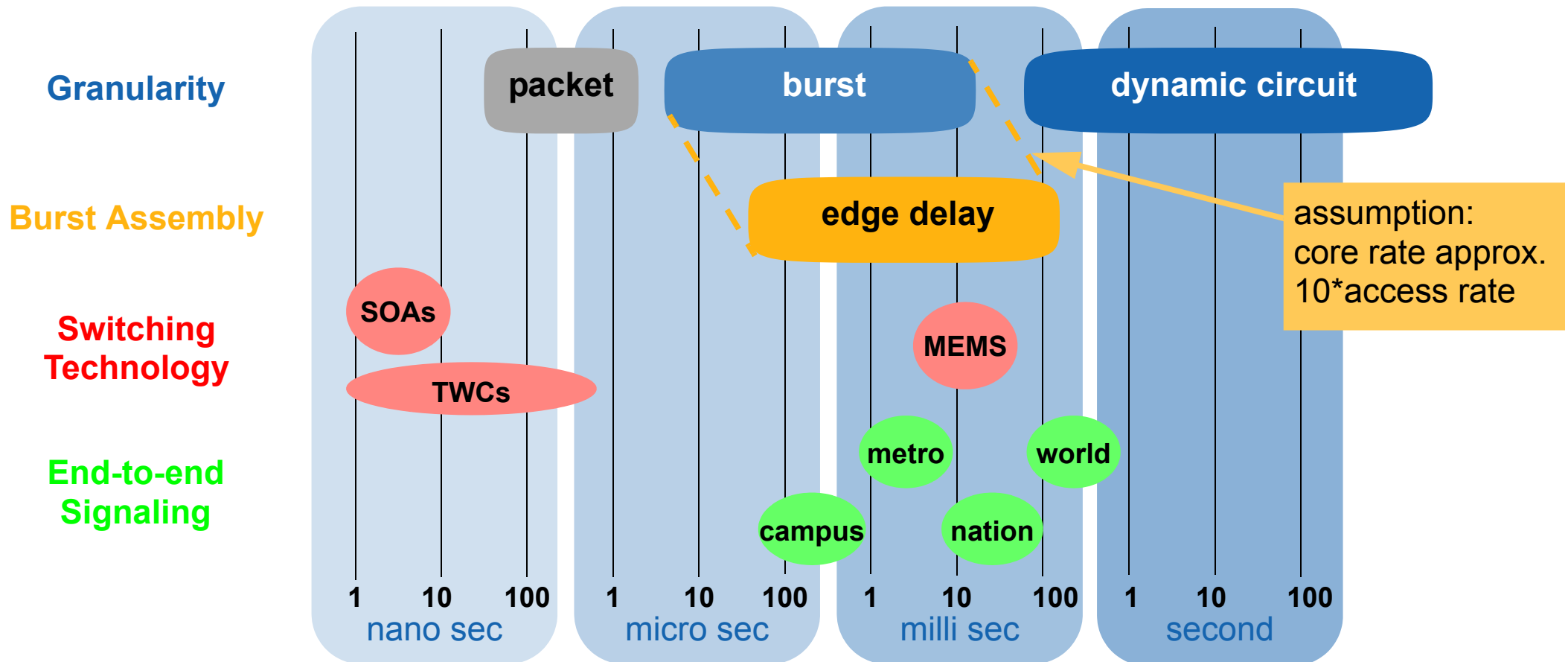
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- **E-Photon One** **N.N.**
Politecnico di Torino/I, Fabio Neri, neri@polito.it
- **COST 266** **sirius.ure.cas.cz/dpt240/cost266/**
Management Committee, Anton Kuchar, kuchar@ure.cas.cz

National Projects

- **Belgium**
 - project at IMEC on OBS
- **France**
 - Rom-eo
- **Germany**
 - BMBF TransiNet www.transinet.de
 - BMBF MultiTeraNet BurstNet www.multiteranet.de
- **Italy**
 - Ringo www.optcom.polito.it
- **UK**
- ...



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