



Universi

Networking Research Challenges Workshop

Panel 1:

International Networking Research:

Tomonori Aoyama (Keio University)

Bill St. Arnaud (Canarie Inc.)

Michael Stanton (RNP)

Dimitra Simeonidou (University of Essex)

Cees de Laat: (University of Amsterdam)



- Updates on outcomes in using international research networks for network research: i.e. how useful there have been in addressing major network research questions?
- Identify areas for networking research where the use of large scale (international) networking facilities can be critical.
- Describe the shape and features of a future research infrastructure (technologies, test-beds, connectivity, scale).
- Is there a need for local/national/international test-beds to prototype and demonstrate L1/2 network technologies and functionalities? What would be the main characteristics for such test-beds?
- Can we create a framework for deploying and test new/early prototype technologies (i.e. nsec optical switching, slow-light devices, coherent optical devices, optical interconnects etc). What are the challenges for integrating such devices/systems with the local or wider area operational network?
- How can we develop formal and structured methods for designing and performing network experiments over test-beds and operational networks? How can we analyse and interpret results in a meaningful and comparable way?
- What will be the role of network virtualisation and federation in developing and evolving large



Research Networking for Network Researchers: A UK Infrastructure for Clean Slate Network Research

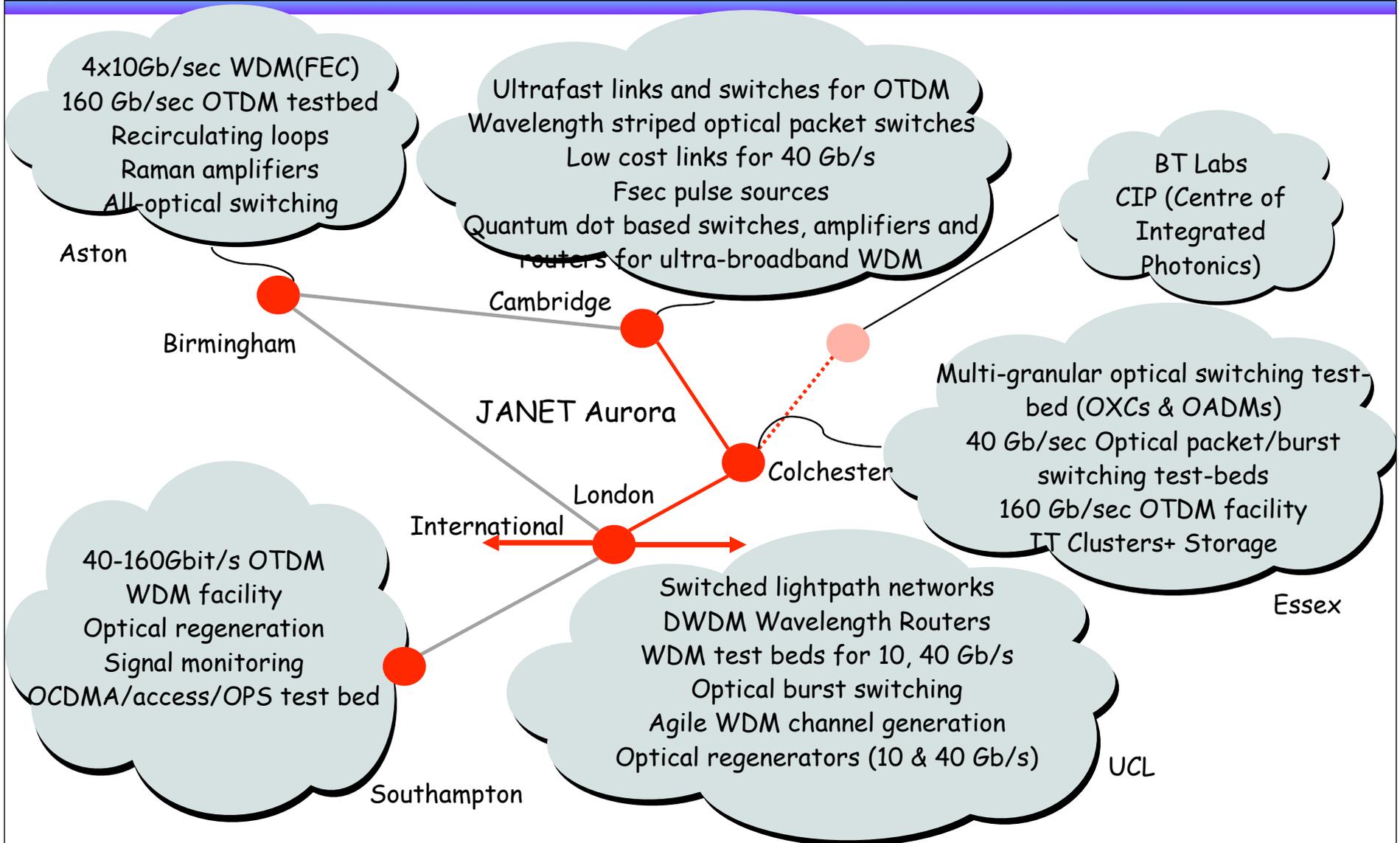
Dimitra Simeonidou

Photonic Networks Research Laboratory
University of Essex
United Kingdom



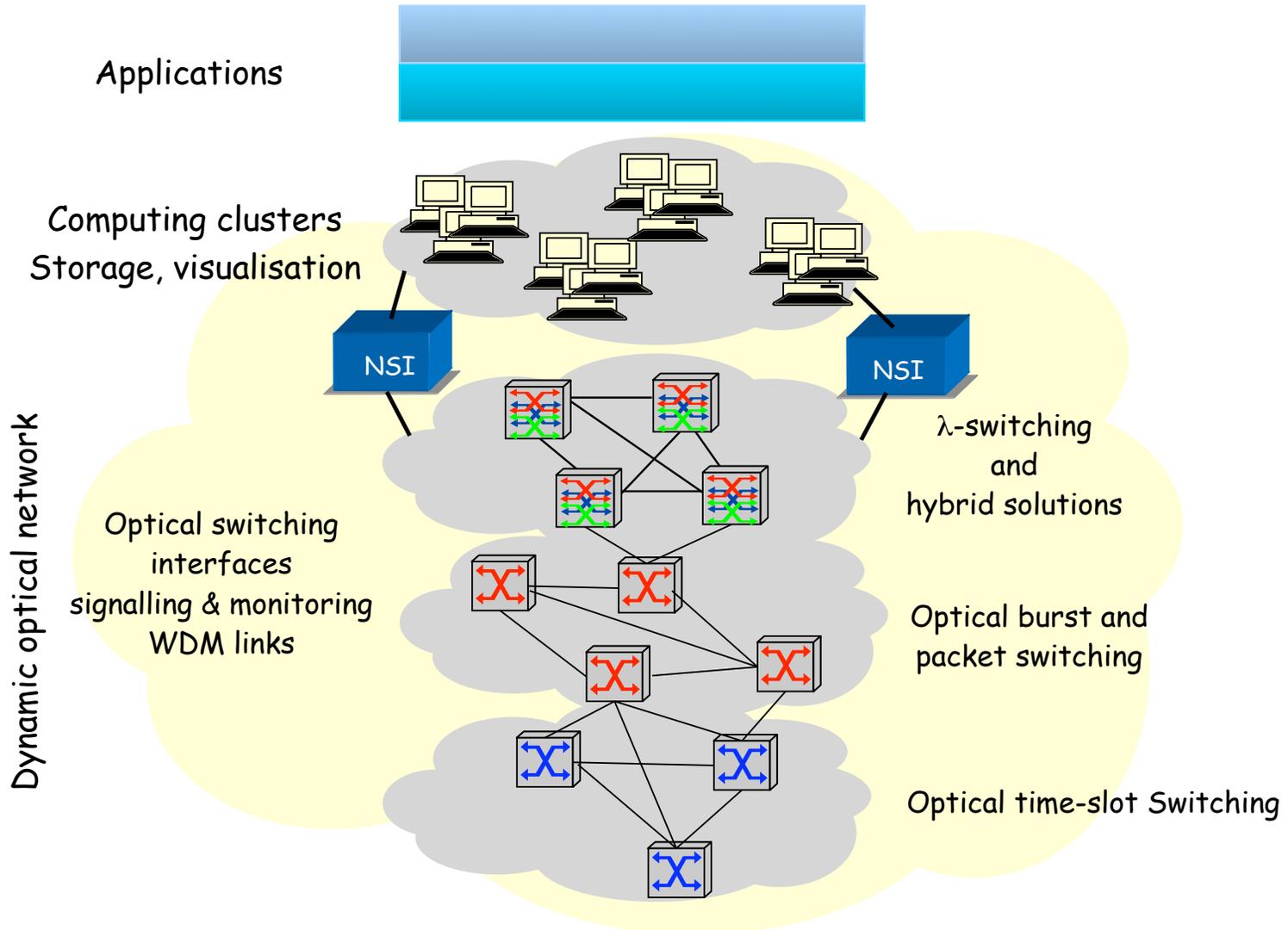


JANET Aurora DF for UK Network Research



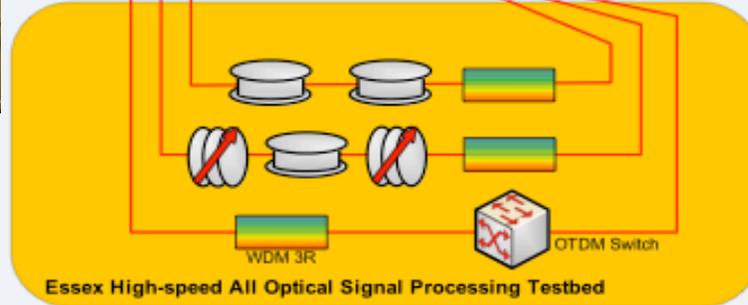
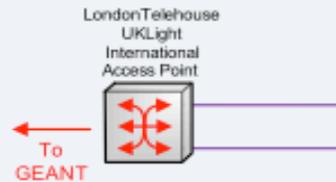
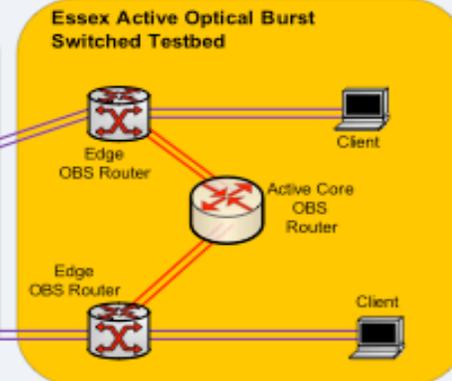
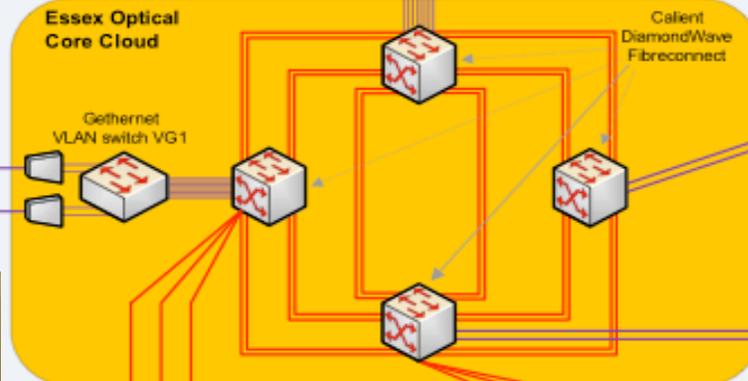
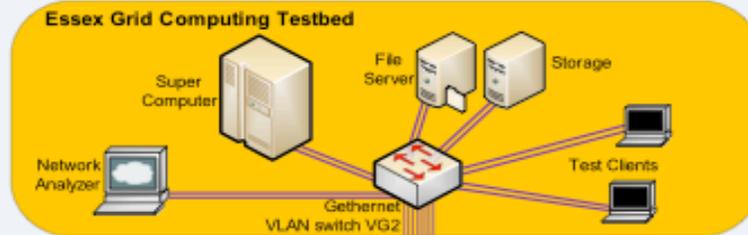


JANET Aurora : An Infrastructure for UK Advanced Network Research- The UK Future Internet Test-bed





UESSEX



— Gigabit Ethernet
 — Optical Link

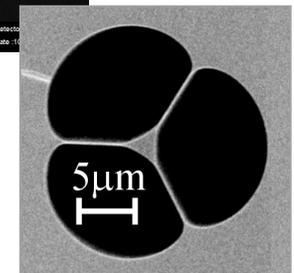
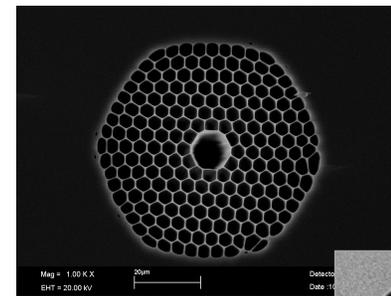
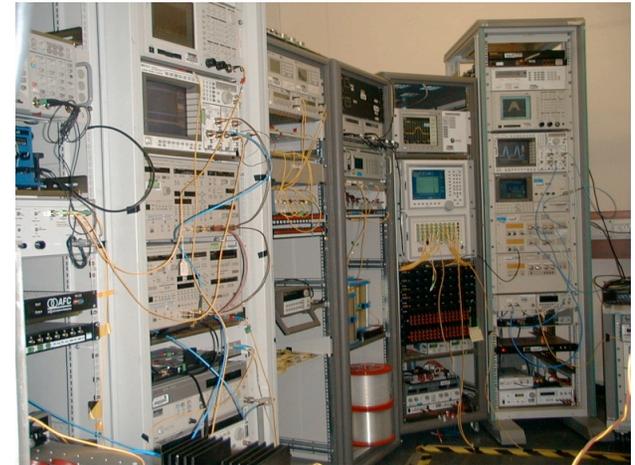


- EDFA current sources
- Power supplies
- MLL current source & temp. controller
- 4 x 10.7 Gb/s pulse pattern generator
- Optical mux for 43GHz pulse gen.
- 10.7GHz 2ps MLL
- 43G electrical Mux & 33% RZ Tx
- 43GHz clock source
- Lambda mux & polarisation control
- Laser Diode bank

- Measurement automation & monitoring & optical sampling oscilloscope
- 4 x 10.7 Gb/s error detector
- Rx optical front end (2 x (EDFA + filter))
- 43G electrical Demux & Clock and Data recovery
- Attenuator & power meter for Rx optical front end
- EDFA current sources
- Power supplies



- Recirculating loop
- WDM test bed
- Access (OCDMA) test set up
- State-of-the-art fibre-based, semiconductor based switches and amplifiers for ultrafast signals
- High power fibre laser and amplifiers
- Switching and signal regeneration activities at ultrahigh bit rates
- Access to fibre, planar waveguide and fibre Bragg grating fabrication facilities
- Ultrafast nonlinear optical devices (i.e. Frequency converters, regenerators)
- Short pulse lasers
- Precision filters
- Dispersion compensators

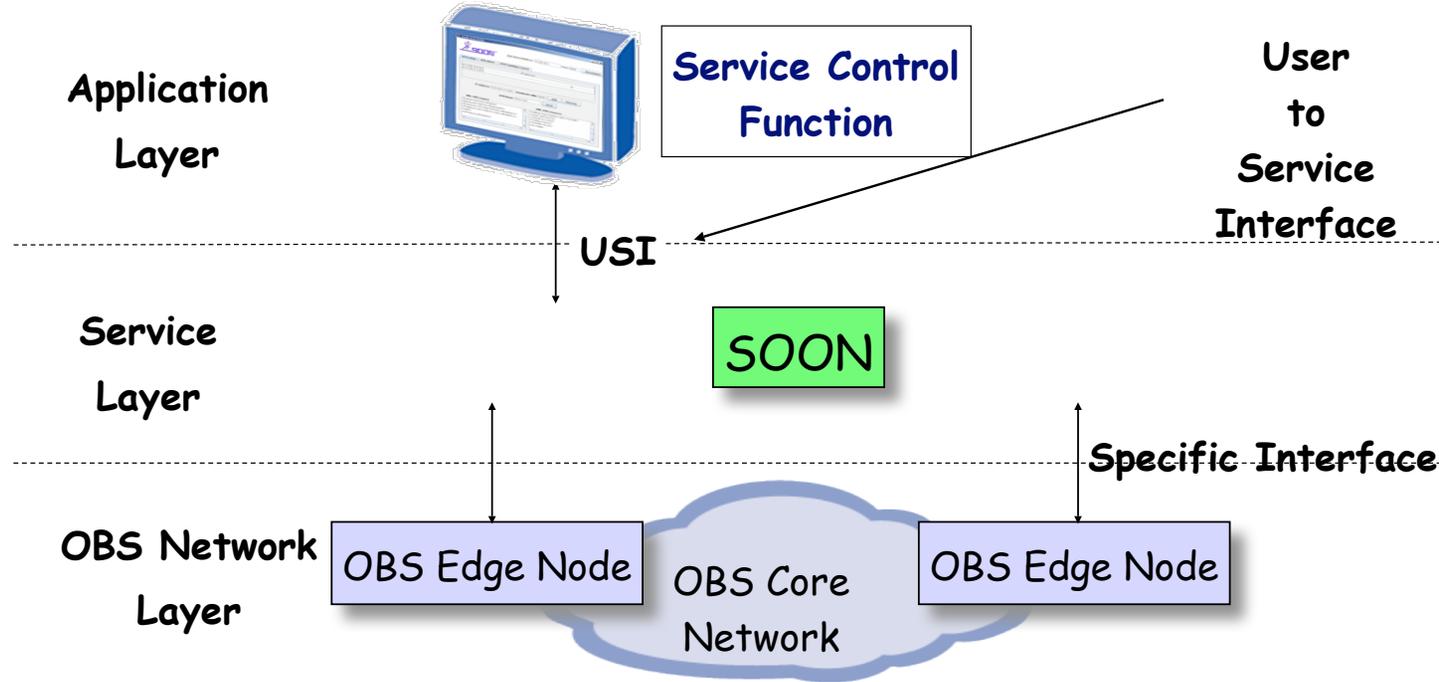




Service Oriented Optical Network (SOON) Architecture and OBS Integration

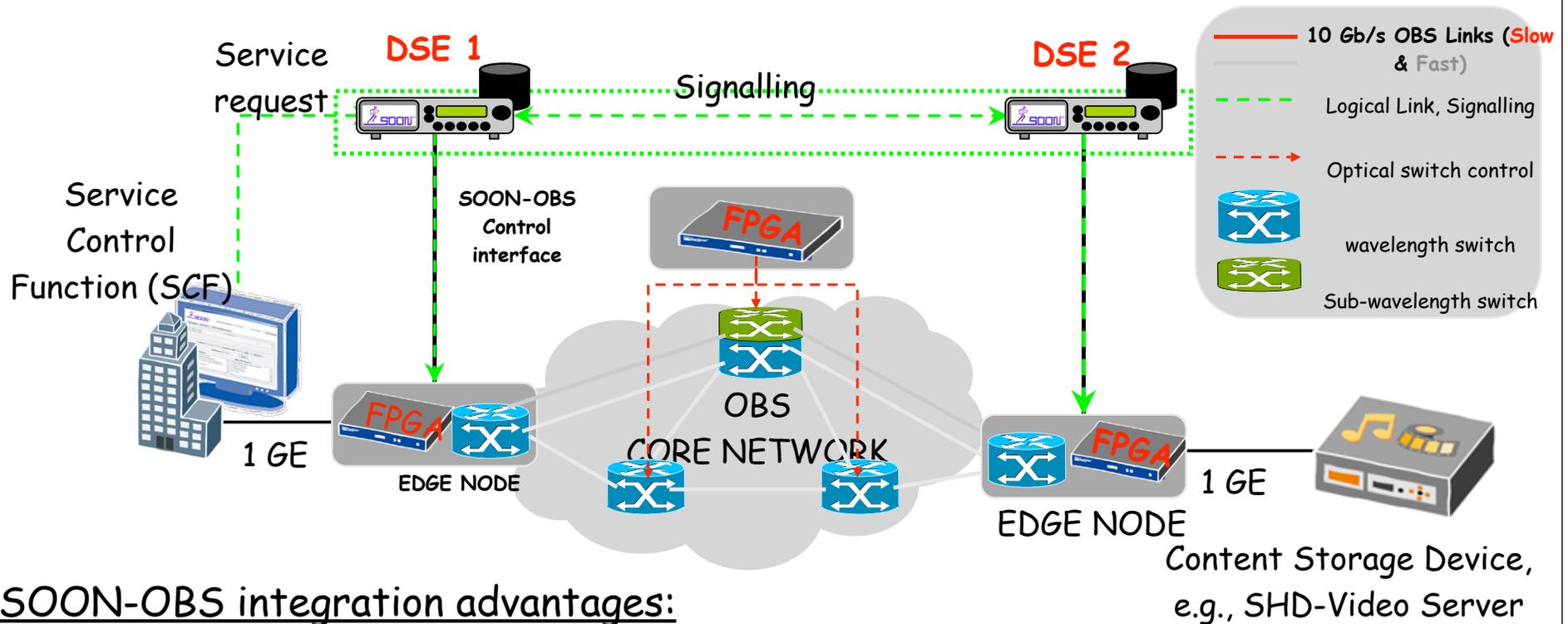
This work investigates the feasibility of an Automatic-Provisioning of QoS-enable Application services over an Optical Burst Switching (OBS) installed

Testbed



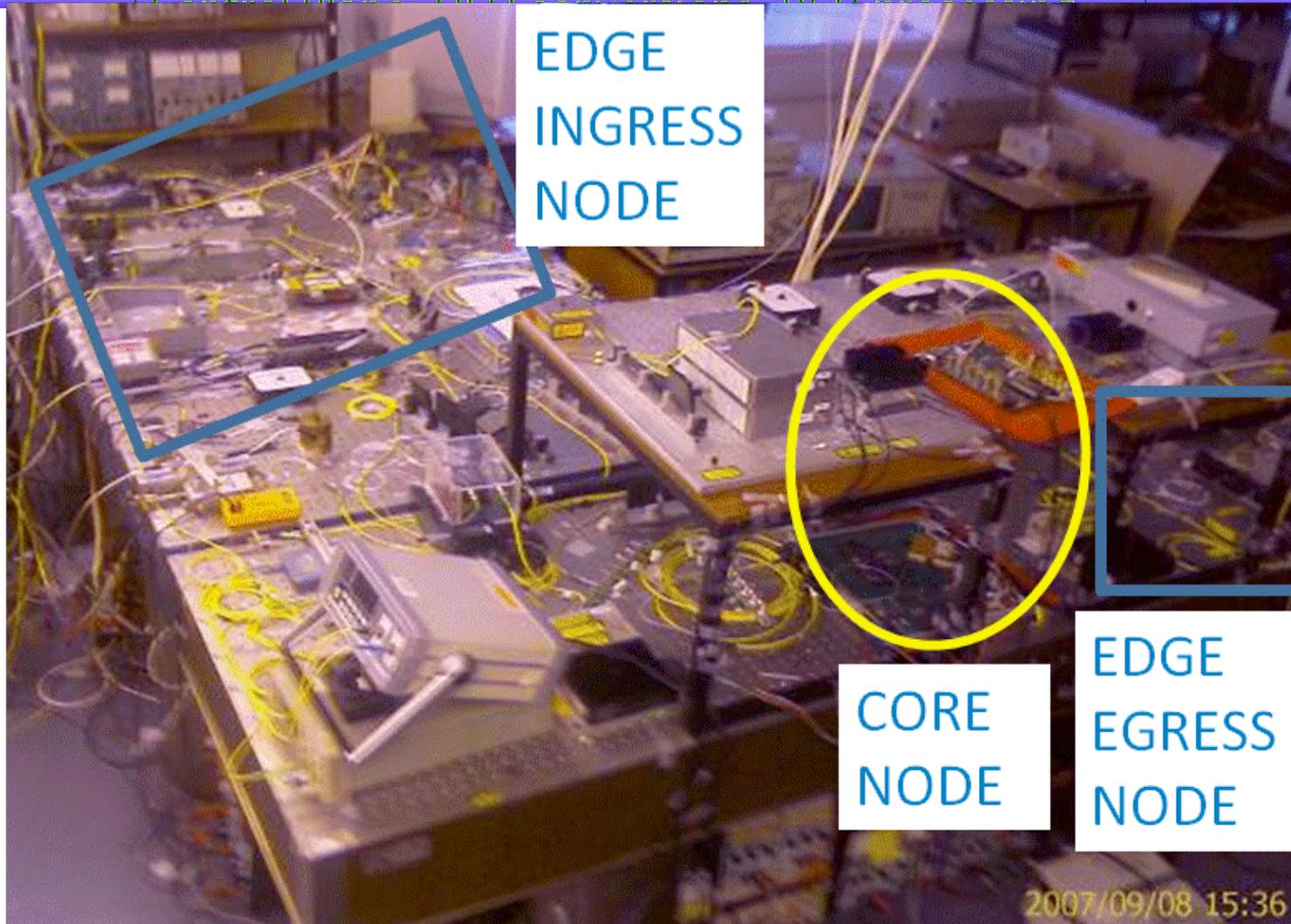


The OBS Network Architecture with SOON



SOON-OBS integration advantages:

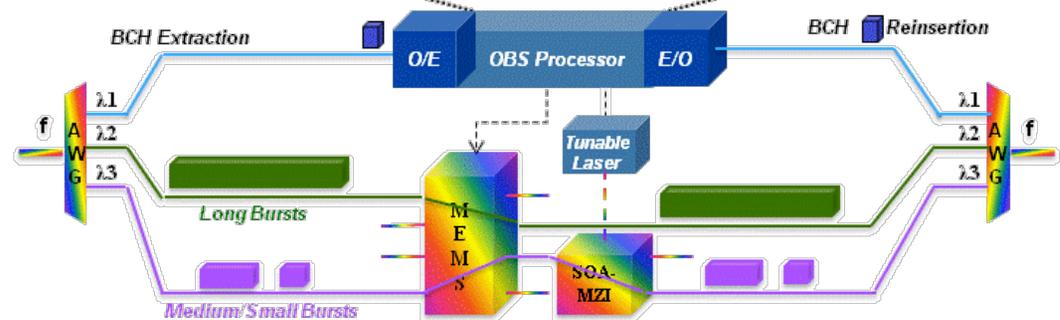
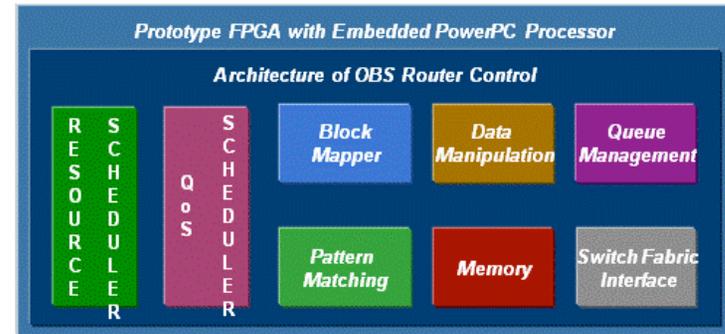
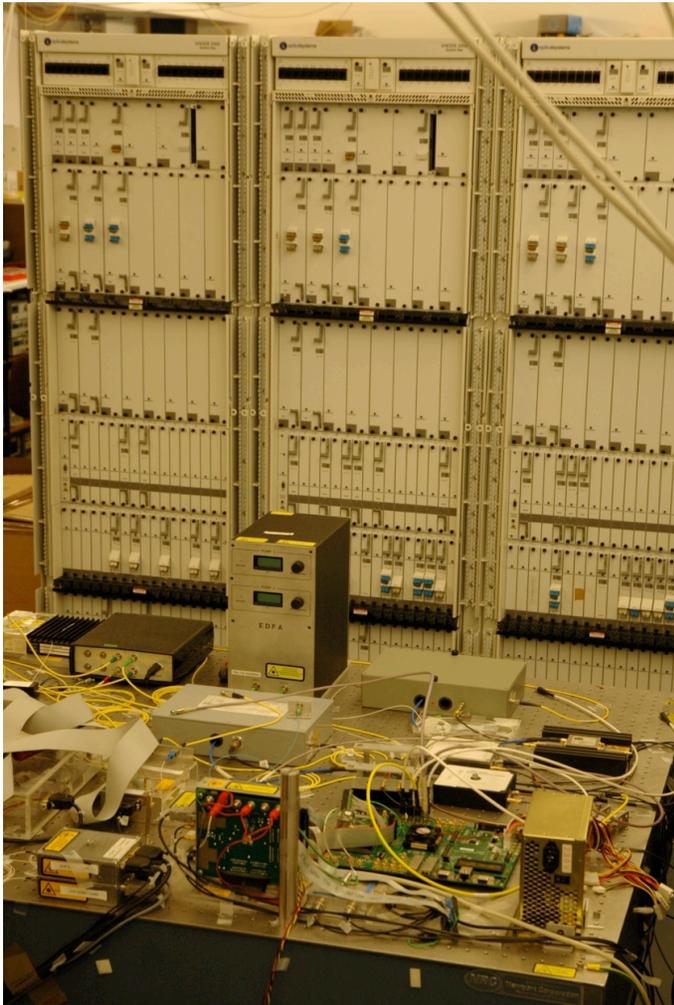
- Offer resources (network and data) as service
- Dynamic interaction between service layer and OBS network layer
- To facilitate intelligent discovery, reservation and co-ordination of distributed resources across the network



Core Switch: Programmable multi-granular switch

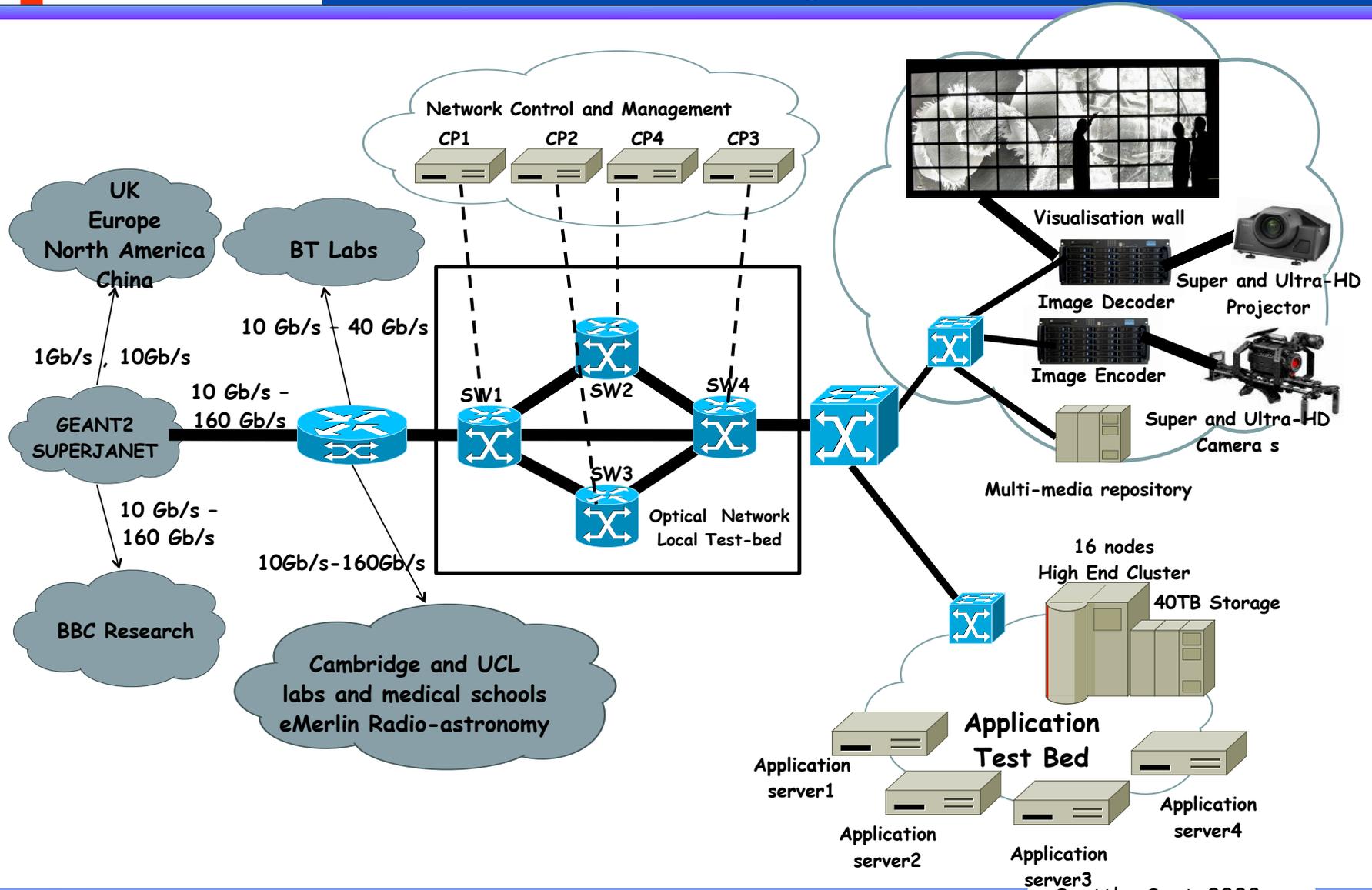


Adding New Layers of Granularity



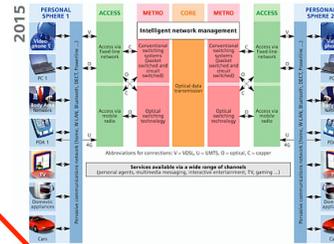


Evolving the UEssex Infrastructure





Aston

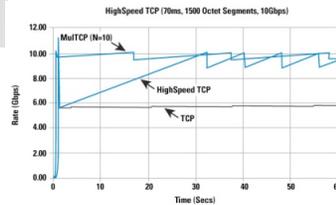


Medical Imaging

Cambridge



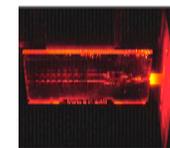
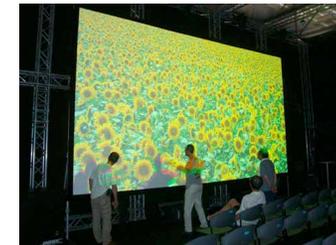
JANET Aurora Essex



UK, Europe, US

BBC

London TeleHouse, UCL



Southampton





Thank you

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