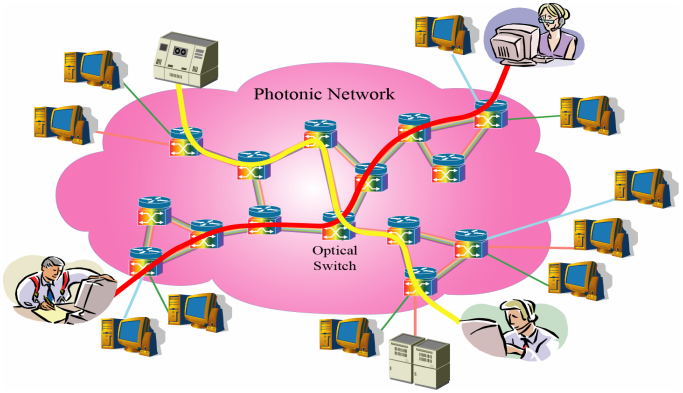
Optical Burst Switched (OBS) Network

Next Generation Optical Network Architecture

Objectives

To envision a design for next generation optical network by taking advantage of high-speed optical switching and dynamic wavelength routing technologies

- Burst assembly at edge nodes and optical burst switching at core nodes
- Distributed routing and wavelength assignment
- CoS support on optical layer

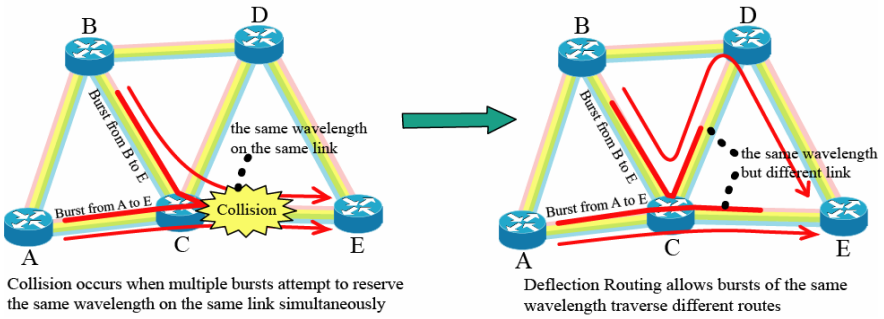


Optical Burst Switched Network Architecture

Protocol and Algorithm

Burst deflection routing protocol

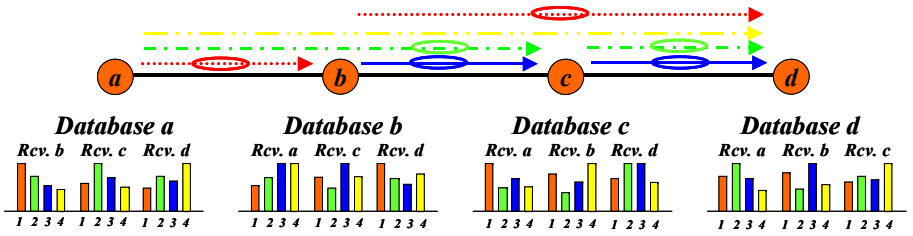
- Deflect blocked bursts to idle fiber links
- Check and retransmit deflected bursts at source node
- Reduce contentions and save bandwidth and time



Burst Deflection Routing Protocol

Priority-based wavelength assignment (PWA) algorithm

- Assign the available wavelength with the highest priority to bursts
- Give larger number of assignable wavelengths to higher priority service
- Provide CoS, reduce burst loss rate and improve bandwidth utilization



PWA Algorithm

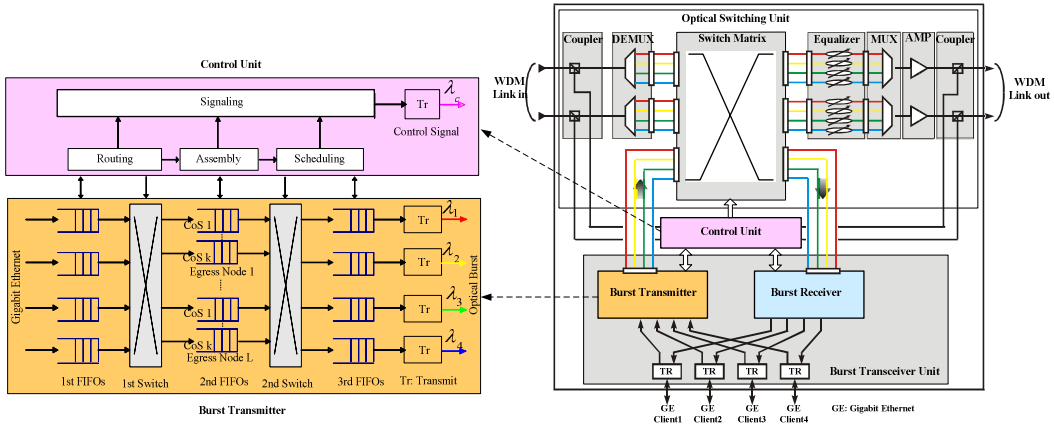
A General-purpose OBS Testbed

A Flexible Network-wide Testbed for OBS Technology

Objectives

To provide a general-purpose and flexible network-wide evaluation environment for OBS technology

- Compatibility and interoperability with IP networks
  - Operate in overlay mode
  - Perform asynchronous variable-sized burst switching
- Generality, modularity and expandability
  - Support various traffic, protocols and algorithms
  - Enable system update by employing advanced devices



Optical Burst Switching Node Architecture

OBS Testbed

Flexible data plane

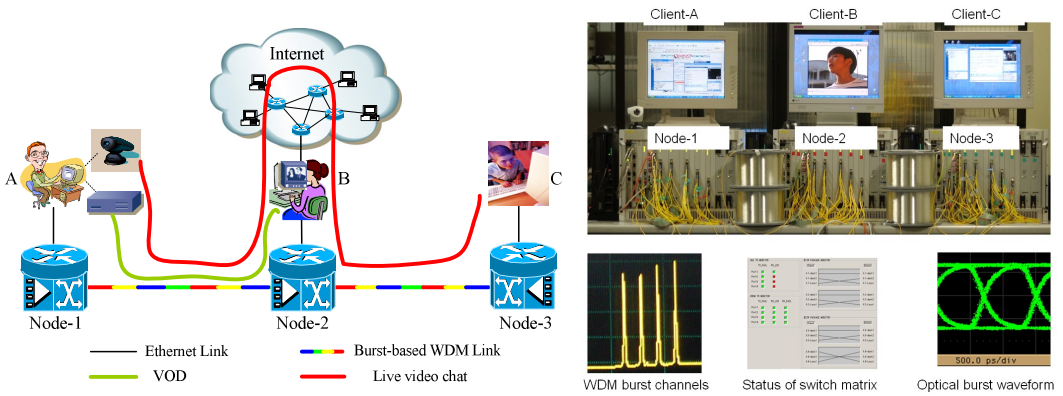
- "Transceiver + forwarding" OBS node architecture
- Burst assembler with CoS and wavelength selection

Intelligent control plane

- Efficient contention resolutions: deflection routing and PWA
- High speed one-way just-enough-time (JET) signaling protocol
- Smart burst scheduling algorithm

Demonstration of services

- TCP-based video on demand (VOD) service
- UDP-based live video chat service



Configuration and Setup of Demonstration