

## RESOURCE RESERVATION STRATEGIES

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### □ Key words

Communications - Software engineering / development

### □ Description

RESOURCE RESERVATION STRATEGIES FOR BOTH SYNCHRONOUS AND ASYNCHRONOUS TRAFFIC IN COOPERATIVE CLUSTERED OBS NETWORKS **discloses advanced periodic resource reservation strategies that fulfil the QoS requirements of heterogeneous traffic, improving the network efficiency and reducing network complexity.** The reservation strategies are proposed for the Clustered Cooperative Optical Burst Switching (C2OBS) network architecture offering a circuit like service without two way end-to-end reservation, while still benefiting from a high level of statistical multiplexing by employing only OBS nodes.

### Background

Optical backbone networks carry both synchronous and asynchronous traffic. The synchronous traffic is mostly from telecomm operators utilizing legacy SONET/SDH over WDM, while the asynchronous traffic comes from IP networks which is also transported over WDM networks over long distances, and is either streamed long flows such as video on demand, video streaming, video conferencing, VoIP and e-science applications, or on-demand bursts.

In the WDM layer, optical circuit switching (OCS) has been widely deployed so far, but it can be potentially bandwidth inefficient especially for highly bursty self-similar traffic such as IP traffic from several different sources.

For this reason, optical burst switching (OBS) has been proposed as an alternative to OCS that increases statistical multiplexing at a subwavelength granularity. Unfortunately, classical OBS still cannot fulfil the QoS requirements of time constrained, loss intolerant, synchronous and streamed long flow traffic.

The present invention presents two advanced periodic resource reservation strategies for efficiently transporting both synchronous and asynchronous streamed long flows over the

C2OBS network architecture, respectively called C2OBS Synchronous Resource Reservation Scheme (C2OBS-SRR) and C2OBS Asynchronous Flow Resource Reservation scheme (C2OBS-aFRR).

### Benefits

The proposed reservation strategies emulate a circuit like service for QoS constrained traffic over an optical burst switching node architecture, without two way end-to-end reservation, while reducing burst drop probability, delay, and jitter.

Moreover, these periodic resource reservation strategies deliver the above said advantages while still operating over a OBS like network architecture which uses relatively simple nodes when compared to other proposed alternatives. [1-13]

### Applicability

Optical burst switching is envisioned as one of the promising technologies for future optical backbone networks. However, classical JET OBS is not suitable for synchronous and streamed long flow traffic due to both its relatively high burst loss probability and end-to-end delay. Furthermore, burst header packet (BHP) generation, transmission, processing and switch fabric reconfigurations for each burst results in an enormous overhead when transmitting synchronous traffic.

The proposed reservation strategies will be applied in future optical burst switching backbone networks for supporting heterogeneous traffic, synchronous traffic from telecomm operators, and asynchronous streamed long flow traffic from IP networks. The proposed strategies reserve resources in advance for both types of traffic, resulting in a reduced burst loss probability and end-to-end delay. Moreover, both types of traffic are supported by employing only OBS switches resulting in lower capital cost and OAM expenditure, unlike hybrid switches which require two or more types of switches.

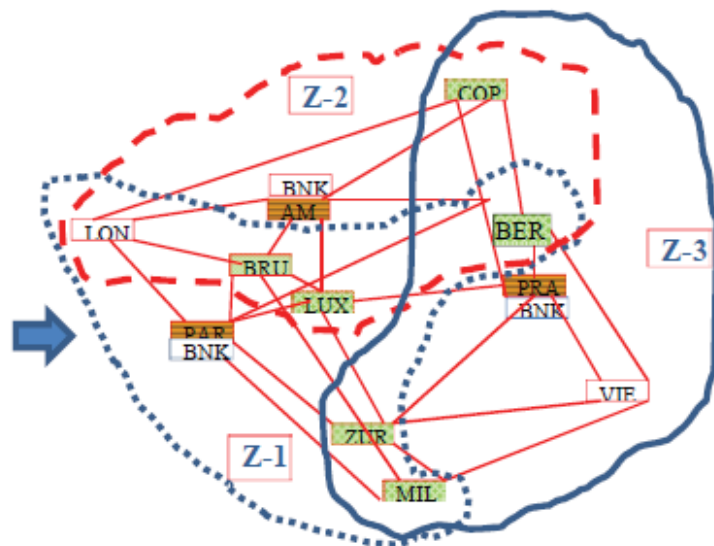


Figure : Cooperative Clustered OBS Network Architecture for COST-239 Network Topology

□ **Applicability of Technology to Maritime SMES**

Suitable for the following sectors: Environmental monitoring - Marine renewable energy - Maritime services - Oil and gas - Security - Transport and shipping - Water management - Other market areas.