

## Design of simulation system for performance predictions of WDM single-hop networks

### ABSTRACT

Describes the design, development and use of a software architecture for a simulation environment to examine, validate and predict the performance of piggybacked token passing protocol for a wavelength division multiplexed (WDM) optical network. This simulation environment overcomes many of the limitations found with analytical models. A set of the principal components and their dynamics, which make up the simulation design has been identified. It is shown that this protocol optimises the usage of the bandwidth available in the optical fibre with more than 70% used for data transmission. It is also suggested that the number of channels required to accomplish a single-hop connection within a local environment is small with number of channels to nodes ratio of 1:4. This is comparatively small and requires only limited-tuneable transceivers.

**Keyword:** Performance evaluation; Token-passing; Optical network; WDM; Network simulation