

Invited paper

From ROADM technology to TOADM technology: on the path towards optical restoration and fully flexible networks

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Abstract

The maturity and market availability of key switching technologies (Planar Lightwave Circuits, Wavelength Blockers, Wavelength Selective Switches) has allowed the emergence of reconfigurable and tuneable optical nodes architectures. This paper reviews these technological building blocks, and investigates how they are driving the evolution of photonic networks towards optical restoration and full flexibility implementation.

Extended Abstract

In the last years, key wavelength switching technologies such as Planar Lightwave Circuits (PLC), Wavelength Blockers (WB), Wavelength Selective Switches (WS) became reliable enough to allow their mass manufacturing and availability on components market. In this paper, we describe these technological building blocks, and show how they enabled the emergence of flexible node architectures like Reconfigurable Optical Add Drop Multiplexers (ROADMs), Tunable Optical Add Drop Multiplexers (TOADMs), and Multi-degree nodes with multi-directional and colourless Add/Drop. We discuss the applications (from multiple-ring interconnection to mesh networks), the benefits of these architectures, and show how they drive the evolution of photonic networks towards a fully flexible transparent layer with complete networking features.

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Jean-Paul Faure obtained a master degree in laser physics from the university of Paris XI Orsay in 1992, and a PhD. in applied physics from the university of Paris VI in 1998 for his work on nonlinear optical imaging. In 1999, he joined Alcatel Corporate Research Center to work on optical switching technologies and photonic node architectures. In 2001, he joined the Optics Division of Alcatel CIT as R&D engineer, and worked on multi-reach transmission platform, line design and ROADM architectures. Today, he is WDM Product Line Manager at Alcatel-Lucent. Regular member of Alcatel-Lucent Technical Academy since 2006, he is author and co-author of 12 patents and several international publications.