

Reliable Overlaid PON Architecture using WDM with Shared Protection

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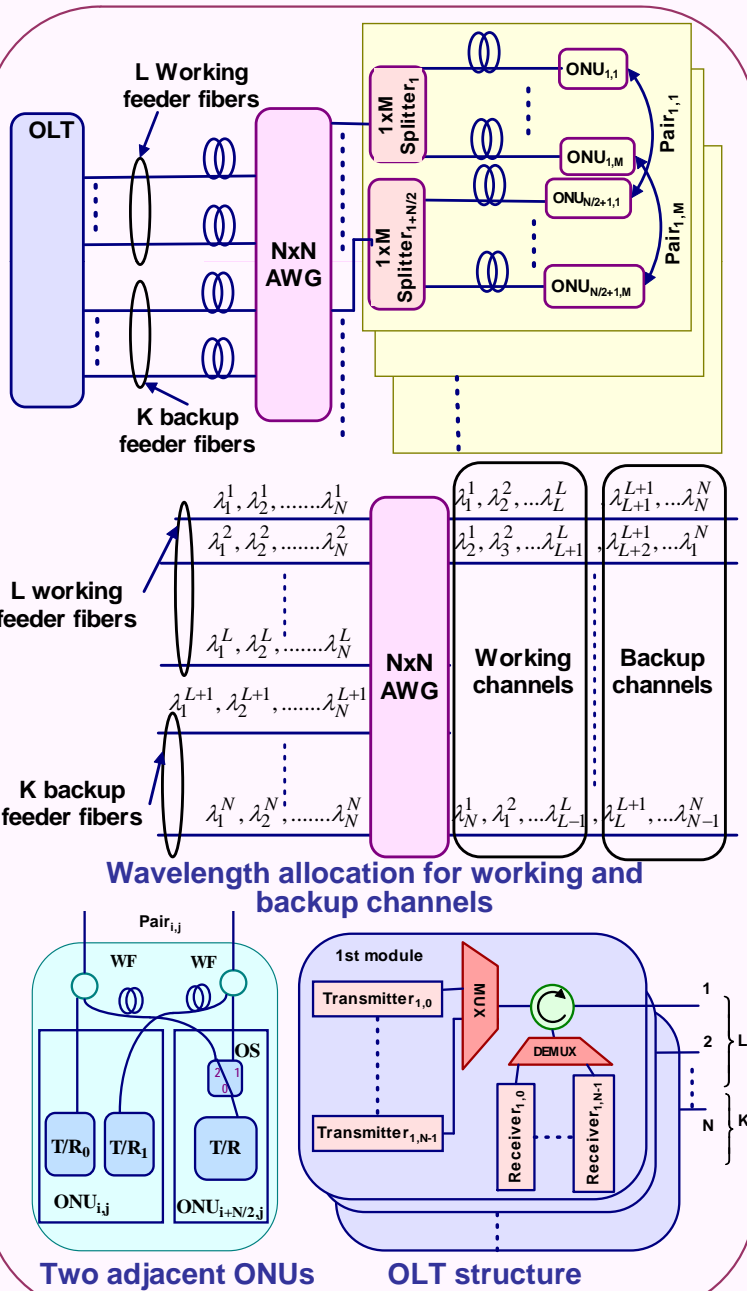
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Next Generation Optical NETworks (**NEGONET**) <http://www.ict.kth.se/MAP/FMI/Negonet/>

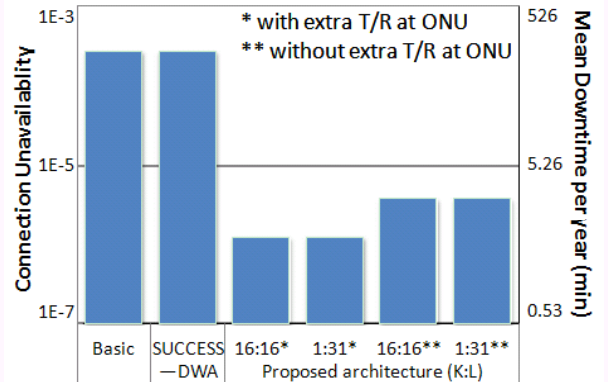
A novel shared protection scheme using WDM in overlaid PONs is presented and evaluated. A large number of users can be supported and connection availability higher than 99.999% can be offered at a minimum cost.

Architecture with K:L protection



Performance Evaluation

Reliability Performance



No. of elements and average bandwidth per ONU

		N basic overlaid PONs	SUCCE SS-DWA	Proposed scheme	
				With extra T/R at ONU	Without extra T/R at ONU
Shared part	No. of FFs	N	N	N	
	No. of FCs	1	1	2	
	No. of T/Rs at CO	L·N	L·N	(K+L)·N	
	No. of NxN AWGs	0	1	1	
Dedicated part (for each ONU)	No. of DFs	1	1	1	
	No. of DCs	1	1	1	
	No. of ICs	0	0	1	
	No. of IFs	0	0	½ (1 for a pair)	
	No. of OSs	0	0	0	1
	No. of T/R at ONU	1	1	2	1
Average bandwidth per ONU in normal operation (bps)*		C·L/M	C·L/M	C·(K+L)/M	C·L/M

FF: feeder fiber
DF: distribution fiber
IF: interconnection fiber
OLT: optical line terminal
ONU: optical network unit
*C is denoted as the line rate in bps per wavelength channel

FC: feeder cable
DC: distribution cable
IC: interconnection cable
OS: optical switch
T/R: transceiver

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