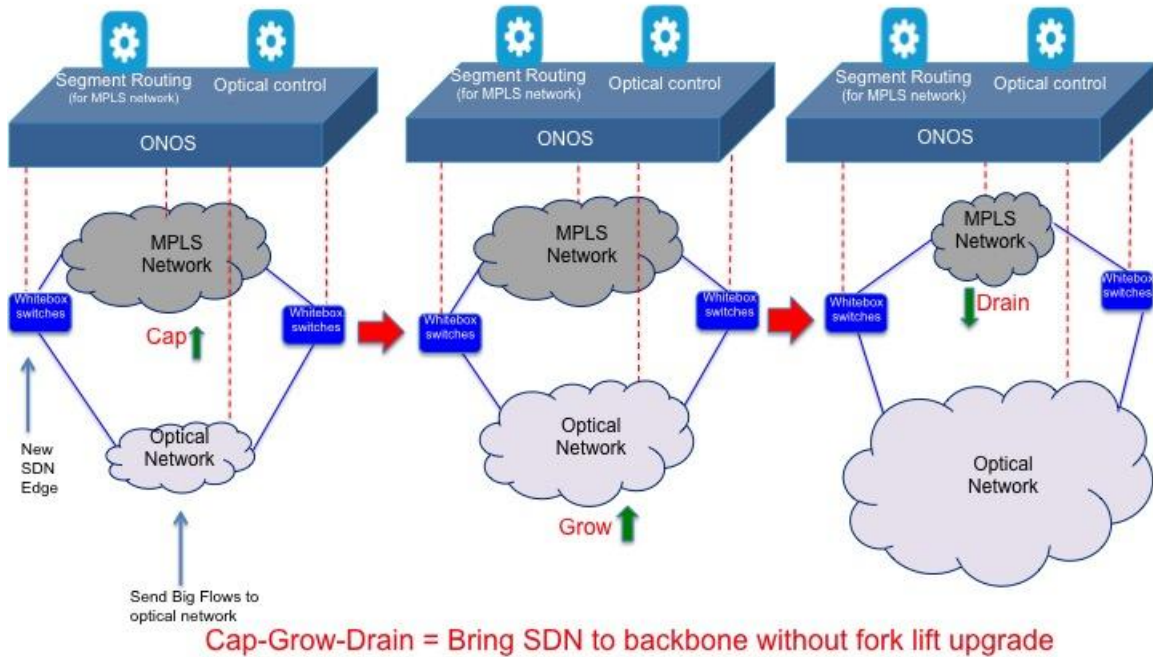


Multi-Layer Network Control - IP/Optical Migration

Cap-Grow-drain Strategy



MPLS networks can be operationally expensive and less agile than their SDN counterpart. Traffic engineering requires complex protocol extensions, and debugging can be difficult. Also, you cannot take advantage of the integrated control of the IP and Optical layers. Finally, MPLS solutions still require expensive, vertically integrated equipment. For MPLS operators who do not want to continue growing MPLS networks and who are looking to gain the advantages of moving to SDN, the Cap-Grow-Drain strategy may be an option.

As optical networks become capable of OpenFlow control, or of being controlled by centralized network operating systems like ONOS, it is feasible to begin transitioning legacy MPLS networks to begin running traffic on just optical while decommissioning the MPLS network. The strategy is called Cap-Grow-Drain and works as follows:

- new flows (perhaps elephant flows) are directed by ONOS to the optical network, bypassing the MPLS network. New traffic is also directed to the optical network. In effect, this Caps the traffic being brought to the MPLS network.
- continue to move more flows onto the optical network. Grow the amount of optical traffic by putting new traffic onto optical and by transitioning legacy traffic off MPLS.
- continue moving traffic off the MPLS network - Drain the remaining flows until it is possible to decommission the legacy network