

# Widening the network equipment market: trading-off switching and routing functionality

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In today's ISP networks, different functionalities are implemented in different regions of the network. At the customer access end, complex routing protocols are not necessary: layer-2 protocols ensure connectivity and adequate forwarding. In the core of the network, where more path diversity is to be leveraged and per-destination path choices may be necessary, complex routing protocols need to be supported. The ossified design of ISP networks has led equipment vendors to propose devices that are optimized for different tasks, e.g. high-speed forwarding, customer-end traffic aggregation, or even management. The network equipment market has evolved in such a way that some ISPs are now feeling stuck with equipment that is costly and not flexible in the role it can play in their network.

We claim that the network equipment market today needs to widen so that the trade-off between switching and routing functionalities can be sampled according to ISP needs. However, designing flexible equipment that has good performance and supports the required functionalities at a reasonable cost is challenging. In this paper, we argue that network virtualization and technologies like OpenFlow provide an opportunity to re-visit the problem of making network hardware flexible and evolvable, without sacrificing performance.