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Get Competitive by Simplifying Your Network

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Thirty years ago, all voice calls ran over a circuit-switched network. Today, the vast majority of voice traffic is transported over a packet-switched network. The main benefit of moving voice to the packet switched network was to lower the high cost of long-distance calls and large, expensive central office equipment that only addressed voice traffic.

At the time, most people thought voice could not be served by a packet network – that latency, jitter, and packet loss would be too difficult to overcome – and therefore the cost savings would never be realized. And yet today almost all voice calls are carried over an IP network leveraging Voice over Internet Protocol (VoIP).

Fast forward 20-plus years, and you'll see that carriers again bear the challenge of transporting different data and private line services in either optical or IP domains. In fact, there are multiple layers of technologies built mainly for these different services that have created an onerous lifecycle management challenge and operational complexity.

To reduce these pain points and simplify the network, we introduce the [Cisco Routed Optical Networking solution](#), which transforms the economics of the Internet for the Future, where converged solutions integrate optics into any router or switch. It provides an opportunity to achieve a significantly lower Total Cost of Ownership (TCO) over the present mode of operations.

In the past, attempts to converge the IP and optical layers were met with barriers, including density penalty, power constraints, and an out-of-sync lifecycle management of the technologies. With optics

technology advances allowing coherent wavelengths to shift from chassis-based line cards to pluggables, the barriers of the past are now overcome.

Silicon is the primary source of economic disruption. Routers, leveraging state of the art Network Processing Units (NPU), scale to 100s of Terabits. 400G coherent Digital Signal Processors (DSPs) and optics are packaged into the Quad Small Form-factor Pluggable-Double Density (QSFP-DD) format, providing the opportunity to redesign and architect the network in very different ways than ever before, driving to significantly lower TCO.

Cisco Routed Optical Networking leverages these disruptions and provides a new solution that converges all service provider transport services onto the packet layer. Segment Routing (SR) plays a major role with sub-50ms protection against link, node, or SRLG failures. SR provides protection with scalable traffic engineering and advanced performance monitoring for circuit-style pathways that can be emulated at the IP layer.

By moving private line and wavelength services onto the IP services/router layer, just like we did with VoIP, we can achieve lower Operational Expenditures (OpEx) with management and control at a single layer, and lower Capital Expenditure (CapEx) by reducing the number of devices in the network. We also optimize wavelength utilization all within an open, multi-vendor platform solution.

With a single services layer based upon IP, flexible management tools are enabled to leverage telemetry for full visibility, while model-driven programmability can help streamline operations for automated turn-up and provisioning. This simplified solution combines open data models and standard APIs to support automation initiatives on a simpler network topology, resulting in a more operationally efficient network.

The Routed Optical Networking solution provides increased flexibility with DCOs that can be used over a supplier's open line system to leverage the assets that service providers have in the network today.

The Cisco Routed Optical Networking solution is a new paradigm that providers are motivated to adopt over the next several years when they compare their present mode of operating to the advancements that are now available. An [ACG white paper](#) shows that if all services run over IP transport networks, savings of up to a 46 percent TCO, 57 percent OpEx, and 35 percent CapEx can be achieved when compared to traditional networks.

The solution is enabled by increased router capacity, lower price per bit, coherent pluggable optics, and significant reductions in OpEx by simplifying the number of network layers. The simplicity of operations is changing in a revolutionary way, so let us show you how to realize the potential in your network.

Learn more about our

[Optical Networking solutions](#)

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