

## Solving Transport Complexity

By: Brandon Peyton, Dean Campbell

Thirty-five years after it first came to life, today's Internet comprises thousands of public and private networks, across which more than 4.7 zettabytes of IP traffic have flowed globally, according to the [Cisco Visual Networking Index](#). To put that figure into perspective, that traffic is equal to all the movies ever produced crossing the world's IP networks in less than a minute.



The Cisco report projects that by 2022, 60 percent of the global population, or 4.8 billion people, will be Internet users, up from 3.4 billion just two years ago. Moreover, 28 billion devices and connections will be online, with video making up more than 80 percent of all IP traffic. In North America alone, network traffic will grow threefold, at a compound annual growth rate (CAGR) of 21 percent, or 108 exabytes per month.

Because the size and complexity of the Internet continues to grow in ways that many could not have imagined even a decade ago, service providers are now focused on transforming their networks to better manage and route traffic, while simultaneously delivering premium experiences. The networks of today are vastly different than the ones we became accustomed to during the first decade of the 21<sup>st</sup> century.

Managing traditional networks has become increasingly challenging as the amount of hardware has grown. Compounded by the complexity of virtualization and the cloud, the enormous surge in traffic generated by the growing number of connected devices, and the coming of 5G, hands-on network management has become a nearly insurmountable task.

**Hyperinteractive Ad Placements**

- Targeted Industry Visibility
- Largest Ad Sizes
- Distribute Marketing Assets
- Capture Sales Opportunities
- Target Key Issues & Topics
- Web & Newsletter Placements
- Extend to LinkedIn, Twitter & Google

**CHOOSE YOUR PLACEMENTS**

**Pipeline**

Click this ad for more information

5G will have significant impact on how we build, manage, and sell services in the near future. With the additional software capability FirstLight has implemented, it now has enhanced visibility to unified inventory, services fidelity, and automated analysis and—in combination with their best-in-class transport network—the company is positioned to be among the best prepared to support 5G as well as the other compliance and technology initiatives of its clients.

More on that later, but first let's take a look at the programmable network.

## Programmable Networking: A Primer

Simply defined, a programmable network is one in which the behavior of network devices and flow control is handled by software that operates independently from network hardware. A truly programmable network will allow a network engineer to reprogram network infrastructure rather than having to rebuild it manually.

Programmable networking has several benefits over traditional networking, including the ability for applications to maintain information about device capabilities and the ability for networks to respond to application status and resource requirements. Most notably, a programmable network enables better allocation of bandwidth and resources, improves operational flexibility, and enhances transparency. Critical for industries that face information security compliance regulations, such as financial services, healthcare, education, and government, network programmability supports emerging privacy and security technologies.

## Where SDN Fits into Programmable Networking

Network programmability is central to software-defined networking (SDN). SDN decouples network controls from hardware and allows the network to be managed by a much more flexible software layer. SDN changes the face of network automation by providing a playbook of open standards and application programming interfaces (APIs).

Before the advent of SDN, network monitoring, analytics, provisioning, and automation would have been achieved by network operators and service providers deploying costly customized development initiatives, each aimed at a specific network component. By enabling network equipment and software to integrate closely together, thus mitigating the development challenges that previously obstructed automation and analysis, SDN enables intelligent network automation and empowers service providers to realize the value associated with it.

While a complete examination of the advantages of SDN is beyond the scope of this article, it suffices to say that faster service activation, network and hardware optimization, continuous monitoring and predictive analytics to achieve enhanced performance, and reduced capital expenditures are chief among them.

The topline advantage SDN provides, however, as compared to a traditional, non-SDN network, is increased service assurance. By deploying SDN to automatically detect, predict, and resolve network performance issues, service providers could reduce the number of network outages.

## Software-Defined Networks and Transport

In recent years, much of the attention surrounding SDN has been primarily focused on Layer 2 and above functionality, but what about transport? Without the transport network, none of the Layer 2 and above services and applications would work. Hence, the question remains: How will transport circuits be installed, rerouted, or removed in the new SDN networks of today and tomorrow?

To understand how LightRiver and FirstLight leveraged their respective cultures of excellence, market awareness, and technical skill sets to transform these complex challenges into 21st century advantages, let's first take a brief look at these two companies.

FirstLight is a leading provider of high-speed data, Internet, data center, cloud, and voice services to enterprise and carrier customers throughout the Northeast over the company's own fiber-optic network. Over the past few years, FirstLight has dramatically transformed through both organic and strategic growth with the acquisitions of segTEL Communications, TelJet, G4 Communications, Oxford Networks, Sovernet Communications, ION Communications, Finger Lakes Technologies Group, and 186 Communications. FirstLight molded them into a single network and company focused on providing high-quality service backed by responsive, locally-based support. The objective was to adopt the latest, highest-capacity, most secure, and most agile transport technologies to bring 21<sup>st</sup> century connectivity solutions to its customers. Via these acquisitions,

FirstLight has integrated the technologies from many vendors into a unified, multi-state, carrier-grade, and high-capacity network that spans from Bangor to Buffalo and Manhattan to Montreal.

A pioneer in the development and support of multi-vendor optical telecommunications network management systems software, LightRiver's netFLEX<sup>®</sup> software enables telecom service providers, utilities, global cloud operators, and other enterprises to efficiently manage anything from a few to several hundred thousand network elements, with support across a broad range of vendors and devices.

The SDN Controller in a software-defined network is the brains of the network. It is the application that acts as a strategic control point in the transport network, managing flow control to the optical devices 'below,' via southbound application programming interfaces (APIs), and the applications and business logic 'above,' via northbound APIs, to deploy intelligent networks. LightRiver's netFLEX<sup>®</sup> platform, a complete turnkey solution, is a multi-vendor optical transport domain network controller. It learns the network from the network, via its auto-discovery and auto-inventory processes for DWDM, SONET, MSPP, DCS, and other network devices in real time. This provides the netFLEX<sup>®</sup> system with the most up-to-date view of the network and its current configuration, a functionality that synchronizes with the ability to provision wavelength and TDM circuits from A to Z across all vendor platforms.

LightRiver's netFLEX<sup>®</sup> Optical Domain Controller (ODC), once fully implemented, will help FirstLight to further integrate legacy, multi-generation, multi-vendor, multi-domain network elements with current best-in-class technology into a single software platform. By providing FirstLight with real-time discovered inventory, actionable analytics for assurance automation, and performance management across its entire footprint, netFLEX<sup>®</sup> ODC will enable FirstLight to transform ten discrete networks into one. Moreover, leveraging the netFLEX<sup>®</sup> ODC, FirstLight's Network Operations Center, engineering, service delivery, and sales teams will gain access to the real-time information they need to operate more accurately and confidently.

Carrier-grade network operators such as FirstLight are driven to ensure network resiliency, increase customer satisfaction by reducing service outages, predict and avert performance issues proactively, and maximize asset utilization and return on investment. As businesses increase their adoption of cloud computing, however, 5G moves beyond trials to become a reality, and the surge of data traffic expected from the Internet of Things (IoT) works to make every community a smarter place to live, work, and play, the ability to leverage all network and service performance data from the transport network and apply actionable intelligence in advance of customer or network impact will be imperative.