

Lumos Parallel Network Operations Centers: Protected Network Monitoring



Lumos Network Operations Center in Waynesboro, VA

Availability of Network Services Is Critical

Network services are critical for carriers and enterprises alike. These services are the literal backbone of carrier organizations and the heartbeat of many enterprise businesses. Lumos recognizes this importance and knows our services must be up and running, so your business can execute and serve customers.

“Like the early days of the Internet, we’re currently in a transformative time as more companies establish online, on-demand services. Businesses that adapt to this new reality will get ahead.”

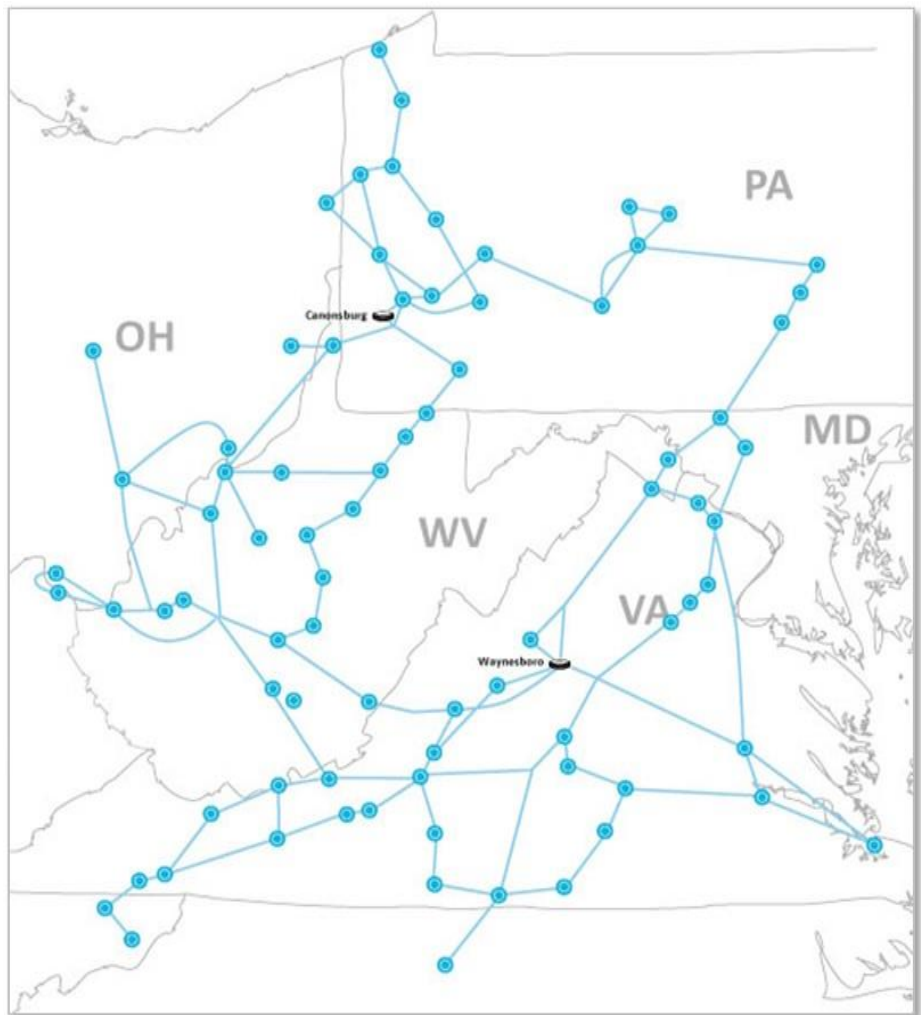
[Online Services Are Critical to Your Business Success](#)

Solution: Lumos Parallel Network Operations Centers (NOCs)

Because your Lumos services are so critical, we have invested in top-notch, redundant Network Operation Centers in Waynesboro, VA, and Canonsburg, PA, to monitor and manage our network footprint, infrastructure and services. The NOCs operate in parallel, with each able to seamlessly take over for the other if the need arises, providing protected monitoring of your Lumos services.

Benefits of Lumos Parallel NOCs

- *Service Protection* – Together, the Lumos NOCs provide 24x7 monitoring of the Lumos network and services to ensure their availability and performance.
- *Business Continuity Disaster Recovery* – The fail-over capability of our parallel NOCs provides extra assurance that our network and services are being monitored and managed around the clock.
- *Resource Offload* – With parallel NOCs monitoring the Lumos network, the IT/telecomm resources at your organization are free to focus on your core business.



Lumos' parallel NOCs are located in Waynesboro, VA, and Canonsburg, PA.

- *Customer Experience* – By keeping your Lumos services running, the parallel NOCs help enhance your customers' experience with your organization.

Parallel NOC Highlights

Each NOC has end-to-end visibility across the entire Lumos footprint – nearly 8,000 fiber route miles, including the core, metro, and local distribution rings for our DWDM, IP, TDM, and Fiber To The Cell (FTTC) networks. For smooth operations and coordination, the NOCs use the same systems, have the same network status information, and share a single, central work queue.

Resiliency

Because the NOCs operate in parallel, with the same systems, information, and work queue, they serve as a failover for each other. One NOC can always assume operations for the other. This resiliency is further enhanced by the geographic distance between the parallel NOCs and their locations outside major metro areas in the mid-Atlantic region.

System and Service Monitoring

The Lumos parallel NOCs monitor the status of network elements and circuits to ensure the reach and availability of our network and services.



Lumos NOC in Canonsburg, PA

Performance Monitoring

The NOCs watch Round Trip Time (RTT) and throughput metrics for Service Level Agreement (SLA) purposes.

Statistics and Accounting/Metering

The parallel NOCs also monitor the utilization of individual circuits for accounting and metered billing.

Fault Management and NOC Tiers

The NOCs perform fault detection, troubleshooting and tracking to identify and resolve network issues, and they use a trouble ticketing system and helpdesk function to coordinate updates to customers.

Tier 1 – Surveillance

Tier 1 of the NOC provides 24x7 surveillance of all critical elements throughout the Lumos footprint including the core and local IP, TDM, DWDM, and FTTC networks. Tier 1 also troubleshoots customer issues using correlation to network events, as well as remote diagnostics and restoration of network elements. This Tier offers technical assistance to the Lumos Network Operations, Service and

Support organizations and generates updates, reports and documentation on all major service outages.

Tier 2 – Troubleshooting

Tier 2 of the NOC coordinates planned network change events and they troubleshoot and drive root-cause analysis of unplanned interruptions.

Tier 3 -- Escalation

Tier 3 of the NOC coordinates and escalates cases to Lumos' Network Planning and Engineering team, as well as our network element vendors. If an issue involves a peering partner, the NOC will escalate to them and work directly with their NOC to resolve the issue. Tier 3 also implements network software and routing changes.

Change Management and Configuration Monitoring

Both of the parallel NOCs conduct change management and configuration monitoring to keep network elements up to date. They approve these activities, schedule them and coordinate with other carriers as needed. The NOCs also log the activities, document them and provide revision control.

NOC Tools

Surveillance and Troubleshooting

The Lumos parallel NOCs use NetCool and vendor-specific Element Management Systems (EMS) to monitor and troubleshoot the network. NetCool creates a central point of real-time service management of network devices, which includes customizable displays of events, service views and operational indicators. The tools are integrated with Granite, Lumos' inventory system, which provides customer and resource information to improve event handling and speed the mean time to resolution.



Lumos NOC in Waynesboro, VA

The EMSs enable auto discovery, software management, and provisioning support for each network element.

Trouble Ticketing

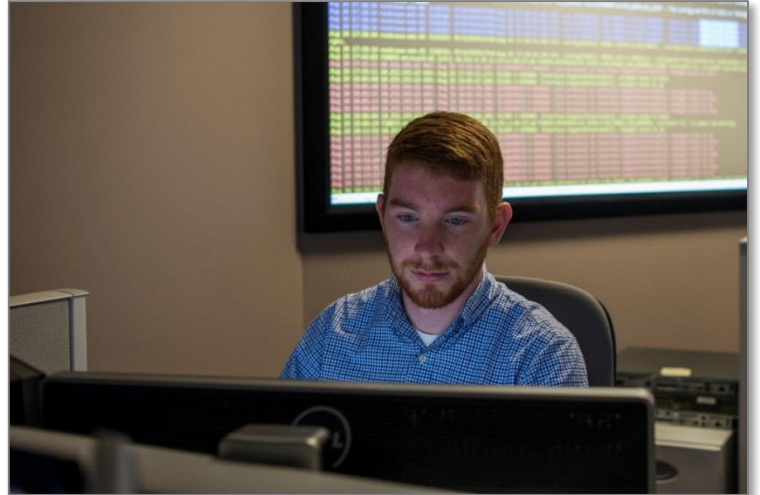
For trouble ticketing and incident and problem management, the NOCs use Service Cloud Control Desk (SCCD), which is integrated with Lumos' record systems. SCCD allows both NOCs to stage and troubleshoot a customer problem, and the information in the system supports SLA management and reporting. SCCD also enhances the NOCs' productivity and efficiency by serving as a single source of record for trouble ticketing and resolution.

NOC Expertise

The teams staffing and supporting the Lumos parallel NOCs have experience in a number of areas, including:

- SONET/DWDM and TDM
- Ethernet/MPLS and Metro Ethernet Forum (MEF) standards
- Dedicated Internet Access
- Advanced IP protocols
- Large complex configurations
- Performance monitoring

A number of NOC staff also have Cisco and MEF certifications. With this range of knowledge and training, the staff is well equipped to monitor and manage the Lumos network and services.



NOC team member in Waynesboro, VA

About Lumos Networks

Lumos Networks is a fiber-based provider in the Mid-Atlantic region serving Carrier and Enterprise customers, offering end-to-end connectivity in 24 markets in Virginia, Pennsylvania, West Virginia, Maryland, Ohio and Kentucky. With an extensive fiber network, Lumos Networks connects to thousands of sites in the region, including cell towers, data centers and on-net buildings. Detailed information about Lumos Networks is available at <http://www.lumosnetworks.com>.