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Lumen Adaptive Networking Solutions Enable Enterprise Customers to Optimize Network Costs and Performance

Business Value Highlights

>4x
more network bandwidth

76%
lower cost of network operations for equivalent bandwidth

331%
five-year ROI

8 months
to payback

Almost 5x
more time for IT network infrastructure teams to focus on business innovation

$4.5 million
per year per organization higher revenue

7.6%
higher gross productivity worth $1.5 million per year per organization

$58,300
higher revenue and productivity per 100 users per year

EXECUTIVE SUMMARY

In this new era of a digitally enabled business, competitive advantage can be realized by offering customers a simplified, timely, and content-rich experience. The enterprise journey to becoming digital native requires the adoption of 3rd Platform technologies such as cloud, mobile, big data, social, and artificial intelligence/machine learning (AI/ML). These new technologies require a network that is adaptable to varying and expanding traffic performance needs, is easy to configure, provides real-time data on customer behaviors, and does not entail an expensive upgrade. Lumen software-defined architecture provides enterprises with an economic model that optimizes cost and performance, accelerating digital transformation (DX).

IDC interviewed organizations using Lumen software-based, cloud, and dynamic networking solutions (collectively referred to as "Lumen Adaptive Networking solutions") to understand their impact on network costs and operations. These interviews demonstrated the extent to which these organizations have cost effectively optimized their networks' performance and capabilities with Lumen. Stated slightly differently, they have achieved strong value with Lumen Adaptive Network solutions by achieving much improved network performance at a much lower cost. The result for interviewed organizations is strong value through their use of Lumen. IDC quantifies this value to be worth a projected five-year ROI of 331%. This is achieved by:

- Providing much greater network bandwidth and capacity without commensurate higher network costs
- Freeing up IT networking staff to focus on business innovation rather than day-to-day maintenance and support

- Enabling business operations by helping organizations deliver higher-performing applications and services to customers and employees, thereby increasing revenue and productivity levels
- Minimizing the extent of interruptions to business operations by reducing the frequency and duration of network-related unplanned downtime

SITUATION OVERVIEW

IDC predicts that worldwide spending on digital transformation technologies will expand at a compound annual growth rate (CAGR) of 17.9% through 2021 to more than $2.1 trillion. This significant growth in DX is underpinned by the realization that DX leads to improved efficiency, new revenue streams, and better customer engagement. These benefits can only be realized with an adaptable network architecture that supports variable growth in data traffic, low-latency application requirements, video-rich experiences, secure and quick access to cloud applications, and real-time analytics on customer behavior.

The industry is undergoing major transformation as evidenced by:

- The accelerating growth of global IP traffic estimated at a CAGR of 40% is impacting the economics of network expansion.
- The Proliferation of IoT and growth of global ecommerce are moving intelligence and data gathering to the edge.
- The continued adoption of the cloud is transforming wide area networks (WANs).
- The evolution to 5G is demanding a flexible architecture to address various use case requirements.
- Enterprises are demanding a rich-media experience to address the needs of their customers.

The network architecture must change to adopt these emerging trends. A key part of this journey to DX is the buildout of an advanced network based on software-defined networking (SDN) principles — a network that is agile and flexible enough to allow an enterprise to host its apps and data across multiple clouds at the lowest cost and with superior performance. Building a self-configuring, automated network that can react to workload-generated stimuli and reconfigure itself for optimal business outcomes will be a foundational cornerstone of the digital business.

LUMEN OVERVIEW

Lumen Adaptive Networking solutions aim to accelerate digital business success by turning data into a valuable resource. Underpinned by automation to manage the deluge of data and improve real-time performance, Lumen Adaptive Networking will drive:

- Faster innovations
- Personalized customer interactions
- Just-in-time operations

Lumen Adaptive Networking solutions are built on a multilayer platform that delivers a flexible and simplified customer experience. At the heart of this platform is a high-capacity fiber network. Lumen has access to 2,200+ on-net public and private datacenters and 170,000+ on-net buildings. It delivers excellent performance with 120Tbps+ of network capacity.

Lumen's portfolio of virtualized network services is dynamic and can be hosted on premises, at the edge, and in the cloud. With Hyper WAN, customer WAN quoting, ordering, and configuration will be simplified using a self-service online experience that provides one flat rate for a single full port that delivers internet and IP VPN network connectivity. Hyper WAN provides customers with a hybrid network that balances application traffic requirements for private access backed by QoS prioritization with IP VPN and high-performance dedicated internet access to the cloud with broadband DIA. Built on the foundation of software-defined architecture, Lumen Hyper WAN supports the flexible, fast addition of other over-the-top virtual network functions (VNFs), such as SD-WAN, routing, firewall, and voice, in addition to fully managed service offerings like CPE.

Lumen addresses the growing need for continual, uninterrupted data movement from the source to the cloud with dynamic connection capabilities. Lumen's dynamic connection platform reduces cloud connectivity deployment from days and weeks to minutes. Customers can choose how and when they want to connect and disconnect with speeds up to 3Gbps of secure, dedicated capacity.

Today, Lumen's dynamic capacity service enables businesses to scale up to three times their bandwidth capacity, which is automatically based on predefined limits and time-of-day parameters or on demand using the Lumen portal. Dynamic capacity service is available across North America, Europe, and Asia/Pacific. Lumen's business customers can connect in real time to top enterprise hyperscaler environments from AWS, Microsoft Azure, Google Cloud, IBM, Oracle, and 2,200+ public and private datacenters.

A key pillar of the Lumen Adaptive Networking platform is embedded network security. Bad actors are actively pursuing security gaps related to ecommerce, access to cloud applications, and IoT devices among other vulnerabilities. Lumen extends on-premises perimeter security across its globally peered tier 1 internet backbone, monitoring routed traffic for threats 24 x 7 x 365 and backed by its Black Lotus Labs and DDoS scrubbing centers that analyze and eliminate attacks. Today, 65% of traffic that originates on Lumen's network terminates on it, providing end-to-end insight and protection for traffic and advanced managed security services over a secure networking environment.

Simplifying the customer experience requires provision of automated and self-service processes. Lumen transforms the customer experience in these ways:

- Simplified price to quote
- Streamlined ordering and configuration
- Flexible Move, Add, Change, and Delete (MACD) of services and features
- Enhanced, portfolio-encompassing service-level agreements (SLAs)
- Digital enablement and self-service

Strategic partnerships are important to complement Lumen's growing Adaptive Networking portfolio and to help accelerate the development cycle. Lumen is actively recruiting public cloud partners and evaluating technology vendors to achieve an ecosystem that promotes multivendor interoperability and optimizes the customer experience.

In summary, Lumen Adaptive Networking solutions are intended to provide enterprises with measurable improvements in enterprise networking costs and performance as will be demonstrated in subsequent sections.

THE BUSINESS VALUE OF LUMEN ADAPTIVE NETWORKING SOLUTIONS

Study Demographics

IDC conducted research with seven organizations that explored the value and benefits for organizations using various Lumen networking solutions, such as Lumen software-defined network, including SD-WAN; Lumen Dynamic Capacity; Lumen Hybrid Networking; Lumen Cloud Connect; Lumen internet and networking, including Ethernet; and Lumen IT and Managed Services (collectively "Lumen Adaptive Networking solutions"). Interviewed

organizations used different and unique combinations of these Lumen solutions, with all using at least two of them and Lumen SD-WAN and Lumen internet and networking solutions being used most often by the interviewed Lumen customers.

Interviewed organizations counted just over an average of 13,000 employees working at 57 business locations with an annual revenue of $2.44 billion. While the organizations interviewed were all based in the United States, the sample had a good mix of industry verticals, including financial services (2), healthcare, industrial equipment, legal, professional services, and utility. For additional information about interviewed organizations, see the Appendix.

Choice and Use of Lumen Adaptive Networking Solutions

Organizations interviewed by IDC described their use of Lumen Adaptive Networking solutions as well as the rationale behind their choice of Lumen. Interviewed customers cited a number of factors for the choice such as gaining the ability to dynamically increase bandwidth to improve network performance, centralization of network management functions, freeing up network teams to work on other projects, and lowering overall costs associated with network usage. Study participants elaborated on these reasons:

- **Need to cost effectively increase available bandwidth:** *"We needed lower networking costs, redundancy, and more bandwidth … In our regular locations, we used to have bandwidth of 3Mbps on average. And now with Lumen, most of our sites have at least 15Mbps uploads and 105Mbps downloads."*
- **Ease of increasing bandwidth to match business demand:** *"We're having a significant increase in bandwidth needs between sites and out to the internet. We've also looked at expanding internationally. Lumen helps with that because it's easier for us to increase the bandwidth and it also allows better centralization of management through dashboarding … "*

Table 1 provides information about interviewed organizations' Lumen networking environments. There were an average of 11,963 internal users of applications running on Lumen networks working at 37 branches or locations. These organizations have access to an average of 118Mbps of bandwidth available within their Lumen environments.

TABLE 1 Lumen Networking Environments

	Average	Median
Number of branches/sites	37	13
Number of business applications	538	120
Number of users	11,963	2,178
Bandwidth (Mbps)	118	50

n=7 Source: IDC, 2020

Business Value of Lumen Adaptive Networking Solutions

The use of Lumen Adaptive Networking solutions has provided interviewed organizations with an agile, scalable, cost-effective, and high-performing adaptive network. With Lumen, they can more easily manage and increase available bandwidth, thereby ensuring improved performance for applications and services running on their networks. Moreover, interviewed organizations reported achieving much-improved network performance without needing to make commensurately higher investments in their networks, thereby achieving a much-improved network performance–to-cost ratio.

Overall, this has resulted in two sets of benefits for study participants that are critical from both an operational cost and a business perspective. In short, study participants have achieved much stronger network performance, agility, and functionality with Lumen Adaptive Networking solutions. These are improvements in their networks that study participants could not have achieved with their previous networking environments without incurring significant additional costs. Study participants linked these cost and performance advantages to Lumen Adaptive Networking solutions:

- *"We have more peace of mind in our external connectivity with Lumen, which we need because we have 24 x 7 x 365 operations … Lumen has definitely improved our network performance because before we were at 50Mbps and now we're on a Gbps connection."*
- *"We needed to upgrade with Lumen in order to implement our digital strategy because it's vastly expanded the amount of data that's going to the cloud … We previously didn't have the bandwidth in terms of throughput to do this."*

For purposes of its financial analysis, IDC calculates that interviewed organizations will realize $17.80 million in benefits per organization ($148,700 per 100 users) through their use of Lumen Adaptive Networking solutions by:

- **Optimizing network-related costs and staff time requirements,** which IDC quantifies as having an average value of $14.88 million per organization per year ($124,300 per 100 users)
- **Improving business results and employee productivity levels,** which IDC projects will be worth $2.92 million per organization ($24,400 per 100 users)

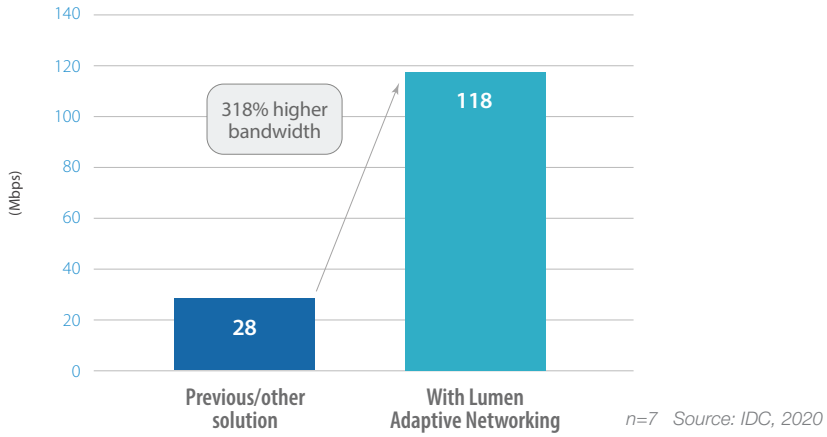
Cost-Effective Improvements to Network Performance

Interviewed organizations understood that they faced a business imperative to improve their organizations' overall connectivity between their distributed datacenters and cloud-based applications, corporate and remote sites, and customers. Their existing network environments had come up against performance and capacity limitations that they could only overcome with huge investments that were not feasible. Instead, they realized that turning to more dynamic, software-driven networking approaches with Lumen would offer them the ability to dynamically increase their network bandwidth and ensure that network bottlenecks would not slow or otherwise impair critical applications for internal users and customers.

Interviewed organizations reported that with Lumen Adaptive Networking solutions they have substantially increased bandwidth available to their businesses. Further, moving to more dynamic and software-driven networking with Lumen Adaptive Networking solutions enables them to make better use of bandwidth and network capacity by shifting them to avoid bottlenecks and meet demands from business applications.

As shown in Figure 1, interviewed organizations have increased bandwidth levels by more than four times (318%), going from an average of 28Mbps to 118Mbps, representing a substantial improvement in fundamental capability for the networks connecting their users and linking them to their customers.

FIGURE 1 Network Bandwidth



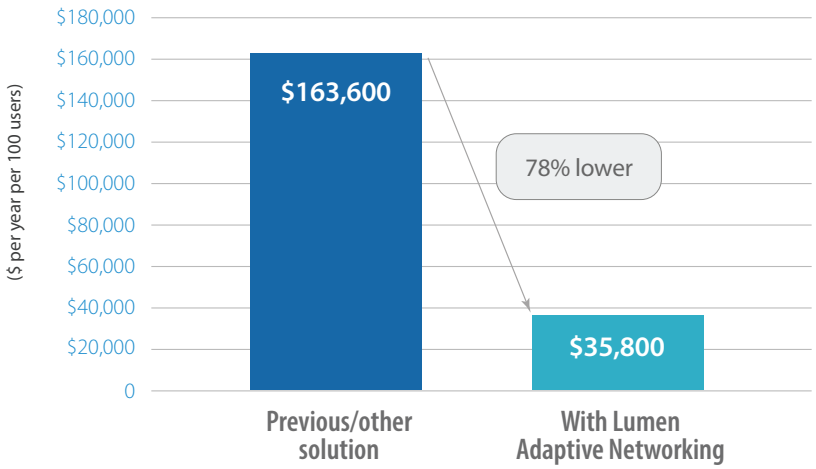
n=7 Source: IDC, 2020

Importantly, study participants reported that they have achieved these significant gains in network bandwidth and capacity without needing to take on commensurately large network costs. In fact, most interviewed organizations reported that they have deployed Lumen Adaptive Networking solutions at about the same overall cost as their legacy networking environments, or even at a lower cost. This means that interviewed organizations have either held their spending flat or nearly flat even as they significantly increase their networking capabilities, or even reduce costs while improving network performance. Study participants described their experiences in achieving higher performance, but without commensurately increasing costs with Lumen Adaptive Networking solutions:

- **Lower cost but improved network performance:** *"The cost of SD-WAN with Lumen is significantly less than the cost of MPLS … The new Lumen networking system will cost about half as much as previously, but we'll have the same or better services than before … We were close to our bandwidth cap so we were bumping up against that more and more, which prevented us from rolling out other things."*
- **Much increased bandwidth for similar cost:** *"We have SD-WAN appliances and fiber between our branches now with Lumen, so our bandwidth capacity went from 5Mbps to 50Mbps to the branches and 100Mbps to the internet … The cost for our previous networking environment was about the same, but we're getting a lot more bandwidth."*

As shown in Figure 2, this means that study participants have leveraged Lumen Adaptive Networking solutions to achieve much more cost-effective networking environments, reducing the cost per 100 users by 78% for equivalent levels of bandwidth.

FIGURE 2 Annual Networking Cost per 100 Users for Equivalent Bandwidth



n=7 Source: IDC, 2020

Beyond cost effectively securing higher bandwidth to support business operations, study participants also reported that they can manage their network environments more efficiently because of the automation, centralization, and SDN capabilities of their Lumen Adaptive Networking environments. These network capabilities allow them to dynamically scale and adjust bandwidth requirements with greater agility and optimally manage WAN network policies in accordance with changing business needs. The ease of carrying out these responsibilities has created efficiencies for IT and networking staff and, in many cases, freed them up to work on other tasks more directly supportive of business needs. One interviewed organization reported: *"We've definitely seen time savings in terms of managing network infrastructure since we moved over to Lumen. We've saved around 100 hours per month because the increased speed from the previous circuit allows us to copy between business units a lot more quickly."*

Importantly, these efficiencies have encouraged and allowed interviewed organizations to focus IT network infrastructure team time on business innovation. Too frequently, network teams find themselves caught in a constant cycle of responsive management and support, which leaves them without capacity for broader business goals. However, by moving to automated and software-defined networking environments with Lumen, interviewed organizations have reduced the day-to-day burden on these teams and increased their time to focus on business innovation by almost five times (378%) (see Table 2). One interviewed organization commented: *"Lumen has allowed us to free staff up to work on other projects, rather than just maintaining and monitoring. For example, our staff is working now on development of*

new web apps and testing various applications that we use, making sure that they are upgraded and scalable for the long term."

TABLE 2 Impact on IT Network Infrastructure Management Team

	Previous/Other Solution	With Lumen Adaptive Networking	Difference	Change (%)
Staff time required to manage network infrastructure, full-time equivalent staff members*	3.3	1.9	1.4	43
Equivalent value of FTE staff time per organization per year	$327,500	$187,400	$140,100	43
Staff time specifically for business innovation, FTEs per organization	0.14	0.67	0.53	378

n=7 Source: IDC, 2020

** Full-time equivalent staff member is also referred to as FTE and is the equivalent of 1,880 hours of staff time per year.*

Staff efficiencies have also extended to help desk operations in support of network-related issues. As shown in Table 3, after deployment of Lumen Adaptive Networking Solutions, interviewed organizations have reduced the amount of help desk time required to support network-related issues by an average of 58%. Their ability to minimize time required for network-related support is related to improved ability to identify and respond to issues affecting their networks, with study participants reporting that they can respond 38% faster on average to network problems with Lumen. One study participant explained: *"Complaints about network performance have been reduced with Lumen — the network performs much more speedily. There was a lot more latency in the past …. With Lumen, we can monitor the network and see the capacity more easily than in the past."*

TABLE 3 IT Networking Help Desk: Efficiencies

	Previous/Other Solution	With Lumen Adaptive Networking	Difference	Efficiency with Lumen (%)
Staff time for network-related help desk, full-time equivalent staff members*	11.2	4.7	6.5	58
Equivalent value of FTE staff time per organization per year	$1.12 million	$0.47 million	$0.65 million	58

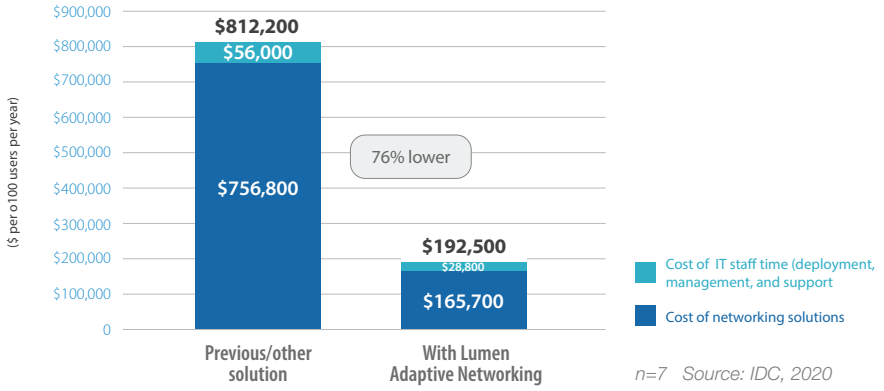
n=7 Source: IDC, 2020

** Full-time equivalent staff member is also referred to as FTE and is the equivalent of 1,880 hours of staff time per year.*

Taken together, these cost and staff efficiencies have enabled interviewed organizations to deliver much improved network performance and functionality to their businesses at a significantly lower cost than with their previous network environments.

Figure 3 shows the cost of operations over five years for equivalent bandwidth, showing that study participants incur 76% lower overall costs to provide equivalent levels of bandwidth with Lumen Adaptive Networking solutions. This is a significant benefit for these organizations, meaning that they avoid costs of more than $600,000 per 100 users over five years as they deliver greater bandwidth, improved agility, and much higher overall network performance to support their business operations (see Figure 3).

FIGURE 3 Cost of Operations Over Five Years for Equivalent Bandwidth per 100 Users



n=7 Source: IDC, 2020

Improved Network Agility and Performance

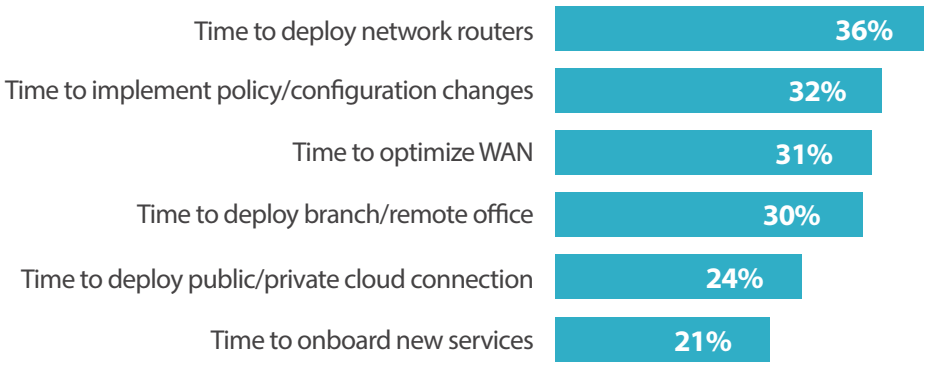
Study participants reported that the use of Lumen Adaptive Networking solutions has provided organizations with more agile, scalable, and high-performing network environments. This has translated into an improved ability to meet changing business demand for network capacity and high-quality network services and performance. Study participants traced these improvements back to having automated, software-driven network infrastructures; the ability to move workloads between cloud and on-premises environments; and increased bandwidth. They provided examples of these types of agility- and performance-related benefits of Lumen Adaptive Networking solutions:

- **Faster device onboarding saves staff time:** *"It takes us less time to onboard new devices to the network with Lumen because it's software defined. To onboard a new device, it probably takes 10 minutes of work now compared with 20 minutes previously."*

- **Improved network speed means better overall experience for users:** *"Our network speed has improved with Lumen, so that's improved how fast applications are performing. We were getting a lot of complaints about these types of things, and now we have a lot of happy people."*

Figure 4 shows the improvements realized by study participants in these areas, ranging from needing 21% less time to onboard a new business service to 36% less time to deploy network routers. All of the activities shown in Figure 4 reflect an organization's ability to react with agility to the need for network and IT capacity.

FIGURE 4 Improvement in Network Agility and Performance Metrics



n=7 Source: IDC, 2020 *(% of improvement)*

Improved network reliability and performance with Lumen Adaptive Networking solutions are reflected prominently in the reduced frequency and impact of network-related unplanned outages for study participants. One interviewed organization linked its move to SD-WAN to ensure redundancy across its operations: *"The definition of SD-WAN is that it literally has multiple links. With Lumen, we went from 13 sites that had redundant connections to all sites having redundant connections. So for a lower price, we get more redundancy." Unplanned network outages can have a significant negative impact on business operations and carry significant business risk.*

Table 4 demonstrates the extent to which interviewed organizations have minimized the impact of these types of unplanned outages on their employees with Lumen Adaptive Networking solutions, going from losing an average of 2.7 hours to 0.5 hours of productive time per user per year, an 81% improvement.

TABLE 4 Impact on Unplanned Downtime

	Before/Without Lumen Adaptive Networking	With Lumen Adaptive Networking	Difference	Efficiency with Lumen (%))
Number of unplanned outages per year	47.3	14.4	32.9	70
MTTR (hours)	3.1	1.2	1.9	61
Lost productive time per year per user of IT services (hours)	2.7	0.5	2.2	81
Value of lost productive time per organization per year, full-time equivalent staff members*	17.28	3.23	14.05	81
Equivalent value of lost productive time per organization per year	$1.21 million	$0.23 million	$0.98 million	81

n=7 Source: IDC, 2020

** Full-time equivalent staff member is also referred to as FTE and is the equivalent of 1,880 hours of staff time per year.*

Better Network Performance Yields Improved Business Results

The previously described agility and performance benefits have real-world implications for the organizations interviewed for this study. They reported that Lumen Adaptive Networking solutions have enabled them to achieve better business results in addition to significant cost and operational efficiencies. With network bottlenecks and downtime greatly reduced through Lumen's automated intelligence and the ability to deliver much greater bandwidth, user and customer applications function more optimally, which contributes to meeting and supporting business goals. This results not only in a better customer experience but higher customer satisfaction and the ability to better address business opportunities. Interviewed organizations spoke to these types of business impact:

- **Higher customer satisfaction:** *"Our customers are just happier with Lumen. Our customer satisfaction is about 8.6 now, and it was probably about a hard 7 before … For the business, it really goes back to mitigating the network performance issues that were coming up, and we're doing it more in a timely fashion with Lumen."*
- **Generating more business volume and revenue:** *"Because we've been able to enhance our internet capabilities with Lumen, we're getting more applications for our services and more business through our website — around 10% more revenue."*

Table 5 shows the revenue gains interviewed organizations linked to their use of Lumen Adaptive Networking solutions. As shown, higher gross revenue per year was calculated at $4.0 million on an organizational basis ($33,400 per 100 users).

TABLE 5 Business Operations Impact: Revenue

	Per Organization	Per 100 Users
Higher Revenue: Improved Performance		
Higher gross revenue per year	$4.00 million	$33,400
Higher gross revenue (%)	0.16	0.16
Higher net revenue (recognized revenue, IDC model*)	$599,900	$5,000

n=7 Source: IDC, 2020

** IDC model assumes a 15% margin for recognizing revenue gains.*

Several interviewed organizations also reported that the Lumen platform provided benefits with respect to business continuity. As a result, they found that they have reduced or eliminated revenue-impacting outages affecting their businesses. One study participant commented: *"With Lumen, we're much quicker to find and resolve an issue now than we had been in the past … On the new Lumen environment, we've had zero unplanned downtime compared with 10–12 outages in the previous six months … These all impacted revenue, and we were losing $60,000–100,000 per event."* Table 6 shows these impacts in terms of reduced unplanned downtime with higher gross revenue per year calculated at $500,000 on a per-organization basis for a total revenue impact of $4.5 million per organization when considering higher revenue related to performance, agility, and reduced outages.

TABLE 6 Business Operations Impact: Reduced Unplanned Downtime

	Per Organization	Per 100 Users
Higher Revenue: Reduced Unplanned Downtime		
Higher gross revenue per year	$500,000	$4,200
Higher gross revenue (%)	0.02	0.02
Higher net revenue (recognized revenue, IDC model*)	$75,000	$600

n=7 Source: IDC, 2020

** IDC model assumes a 15% margin for recognizing revenue gains.*

For interviewed organizations, network functionality and performance are foundational to the overall performance of business applications supporting internal users, partners, and actual/potential customers. After deployment of Lumen Adaptive Networking solutions, these groups enjoyed improved network and application performance, with internal employees working

more effectively as a result. One interviewed organization explained: *"We're getting better user experience with Lumen because users in remote sites are not seeing those delays related to bandwidth and are getting better response times … Our users are absolutely more productive because of the better performance."*

Table 7 shows the impact for study participants in terms of this higher user productivity. As shown, study participants attributed an average gross productivity increase of 7.6% to almost 9,000 users to their use of Lumen Adaptive Networking solutions, resulting in productivity gains that IDC values at $1.50 million per year per organization in higher productivity.

TABLE 7 Business Productivity Benefits: Higher User Productivity

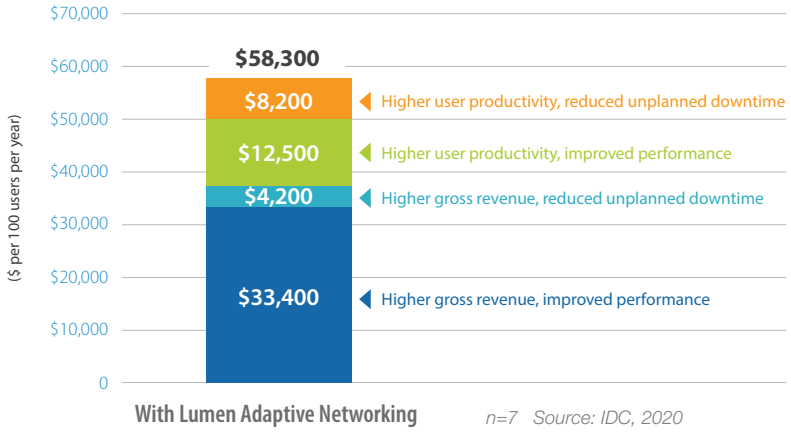
	Per Organization	Per 100 Users
Number of impacted users	8,887	74
Higher gross productivity, impacted users (%)	7.6	7.6
Higher net productivity, impacted users* (%)	1.1	1.1
Net productivity gain (FTEs)	21.4	0.2
Value of higher net productivity	$1.50 million	$12,500

n=7 Source: IDC, 2020

** IDC model assumes a 15% margin for recognizing revenue gains.*

Business and operational benefits for interviewed organizations (per 100 users) are summarized in Figure 5 including revenue gains and higher user productivity related to improved network performance and availability. As shown, these improvements to their network environments will translate to almost $600 in value in higher annual revenue and productivity per user per year. Further, interviewed organizations reported that improved network performance with Lumen is helping them meet an average of 17% more service-level agreements, demonstrating the extent to which network performance improvements have positively impacted business operations and contributed to the business operational benefits shown in Figure 5.

FIGURE 5 Business and Operational Benefits per Year per 100 Users



n=7 Source: IDC, 2020

ROI Summary

IDC's analysis of the financial and investment benefits related to study participants' use of Lumen Adaptive Network solutions is presented in Table 8. As discussed, Lumen Adaptive Networking solutions deliver a clear value proposition for study participants in terms of both network costs and performance.

IDC calculates that, on a per-organization basis, interviewed organizations will achieve total discounted five-year benefits of $62.91 million ($525,800 per 100 users) in network cost savings and cost avoidances, revenue gains, and staff time savings and productivity gains. These benefits compare with projected total discounted investment costs over five years of $14.60 million on a per-organization basis ($122,000 per 100 users). At these levels of benefits and investment costs, IDC calculates that these organizations will achieve a five-year ROI of 331% and breakeven on their investment in Lumen Adaptive Networking solutions in eight months.

TABLE 8 ROI Analysis

	Five-Year per Organization	Five-Year per 100 Users
Benefit (discounted)	$62.91 million	$525,800
Investment costs (discounted)	$14.60 million	$122,000
Net present value (NPV)	$48.31 million	$403,800
ROI (NPV/investment) (%)	331	331
Payback (months)	8	8
Discount factor (%)	12	12

n=7 Source: IDC, 2020

CONCLUSION

Digital businesses must be able to offer customers a strong experience in terms of accessibility, timing, and content. Delivering these types of experiences depends on organizations' ability to leverage data and other emerging technologies such as cloud, mobile, social, and artificial intelligence/machine learning to their advantage. The enterprise network is central to whether organizations can meet increasing customer expectations. Software-defined networks that provide automation and centralized management offer organizations the ability to provide a network infrastructure that allows them to find the right balance between cost, agility, and performance to run digital businesses cost effectively and efficiently.

IDC's study demonstrates the significant benefits that organizations can achieve by using Lumen Adaptive Networking solutions. Most prominently, study participants reported substantially increasing available bandwidth to their businesses, but without commensurate increases in bandwidth spending, thus enabling them to provide a much more robust and high-performing network infrastructure.

Interviewed Lumen customers also described making their enterprise networks more agile and flexible, which allows them to adapt more readily to changing business conditions. Moreover, they reported much-improved network performance, thereby increasing application availability and delivering a better experience to both customers and employees.

Taken together, these benefits of Lumen Adaptive Networking solutions drive cost savings, staff productivity gains, and higher revenue that are worth well more than investment costs, with IDC projecting that the sample of Lumen customers interviewed for this study will see more than a four-to-one average return on their investment (331% five-year ROI).

APPENDIX

Study Firmographics

Table 9 provides additional information about interviewed organizations including their average and median firmographic profiles.

TABLE 9 Demographics of Interviewed Organizations

	Average	Median
Number of employees	13,032	2,300
Number of IT staff	420	45
Number of business applications	577	200
Number of business locations	57	50
Revenue per year	$2.44 billion	$1.1 billion
Industries	Financial services (2), healthcare, industrial equipment, legal, professional services, and utility	

n=7 Source: IDC, 2020

Methodology

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of Lumen Adaptive Networking solutions as the foundation for the model. Based on interviews with organizations using Lumen solutions, IDC performed a three-step process to calculate the ROI and payback period:

1. Gathered quantitative benefit information during the interviews using a before-and-after assessment of the impact of Lumen networking solutions. In this study, the benefits included networking cost reductions and avoidances, staff time savings and productivity benefits, and revenue gains.

2. Created a complete investment (five-year total cost analysis) profile based on the interviews. Investments go beyond the initial and annual costs of using Lumen and can include additional costs related to migrations, planning, consulting, and staff or user training.

3. Calculated the ROI and payback period. IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Lumen over a five-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings. For purposes of this analysis, based

on the geographic locations of the interviewed organizations, IDC has used assumptions of an average fully loaded salary of $100,000 per year for IT staff members and an average fully loaded salary of $70,000 for non-IT staff members. IDC assumes that a full-time equivalent staff member (FTE) works 1,880 hours per year (47 weeks x 40 hours).

- The net present value of the five-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.
- Further, because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

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