

BROCHURE

Harnessing the Power of the 4th Industrial Revolution: Meet the Platform Helping Businesses Acquire, Analyze and Act on Data



LUMEN®



The 4th Industrial Revolution offers tremendous business opportunities

The 4th Industrial Revolution is the 21st century convergence of digital, physical and bio technologies driving an unrelenting acceleration of human progress. For businesses, it's about using data, applications and secure connectivity for a sustainable competitive advantage. Data is the currency of the 4th Industrial Revolution, just as steam, electricity and silicon chips were for the prior industrial revolutions.

Businesses can capitalize on new opportunities through next-generation applications. These applications need a platform that delivers compute across multiple cloud environments, the market edge and on-premises. Together, next-generation applications, adaptive network connectivity and connected security enable businesses to acquire, analyze and act on data to differentiate themselves with innovative products and services.



Imagine the possibilities for your business

By every measure, across every industry, we are in the midst of a technology revolution that stands to significantly redefine the ways we live and work. The increased creation and consumption of data have moved society into the next great industrial revolution focused on intelligent production and digital transformation.

To serve this need, the Lumen Platform is designed to be the fastest, most secure infrastructure for next-generation business applications and data, poised to deliver exceptional customer experiences and help your business harness the power of the 4th Industrial Revolution.

Every industry can benefit. Here are examples of how the Lumen Platform can deliver value in manufacturing, healthcare, retail and smart cities:



Manufacturing

Next-generation manufacturing applications track, monitor and operate every step of the process. Everything is digitized, from supply

chain and logistics to industrial automation and manufacturing floor activities. Multi-domain networks deliver and orchestrate applications to mesh sensor data acquisition with industrial process control, using market intelligence to manage factory output by commanding smart factory production and dynamically operating robots to act.

To implement such systems, a seamlessly networked supply chain shares information among all parties. Applications must be available from anywhere in the cloud, but they must be available close to the manufacturing facility so that data can be analyzed in real time and critical actions taken without delay. Use cases like robotics require processing very close to the device to work rapidly and deliver productivity gains. Finally, all the data must be classified, filtered and secured to prevent IP theft, sabotage, or accidental loss.

Together, these advances can ultimately help lead to greater efficiency in manufacturing, faster throughput, less waste, and greater safety.



Healthcare

Widespread networks already deliver telehealth applications—providing care to remote communities and orchestrating diagnoses, treatments and prescriptions without requiring patients to visit medical facilities. The use of data promises to deliver personalized medicine, and low-latency systems will enable remote robotics applications for surgery and training.

Data security is essential for privacy, and data sovereignty rules dictate how much and what kind of data can be shared by whom, so it becomes even more critical to keep the data from wearable fitness devices and public systems from landing in the hands of malicious actors.

With the rapid growth of big data analytics, wearable computing and personalized medicine applications, more healthcare data is being generated, acquired, analyzed and acted-upon than ever before. Our healthcare is rapidly becoming a data-driven exercise, as automated systems begin to provide earlier detection, better planning, and faster cures around the world.



Retail

As consumer purchasing moves to digital routes vs. brick-and-mortar, customer experiences and outcomes stand to change dramatically. From virtual try-outs using augmented reality, to customized offers based on customers' data, and frictionless “zero-tap” purchases, retail is transforming into a data-driven process where custom products target select audiences with tailored promotions to encourage purchase. These next-generation retail applications require a ubiquitous network and scalable compute power to orchestrate amazing customer experiences with

data security as portable point-of-sale systems help more entrepreneurs and businesses constantly improve how they serve customers.

Data that customers trust with retailers must be kept secure and safe from those looking to steal it. Data theft results in harm to brand reputation and real revenue loss, so it is essential to assure data security when customers choose to share more. Ultimately, the retail customer experience should become easier and more enjoyable, allowing retailers and supply chain partners to use data to continuously monitor and improve the selection of goods and services.



Smart Cities

Increased connectivity will deliver and orchestrate next-generation applications and massive amounts of data among autonomous vehicles, smart homes, intelligent infrastructure, public safety systems and other city services, making it possible for every city to become a “smart city.” For example, smart-connected self-driving cars and traffic signals can manage traffic congestion with a highly-connected network that orchestrates sensor data acquisition on roads and bridges. Vehicle-to-infrastructure applications can deliver actionable real-time analysis to route traffic away from large events, traffic accidents or bottlenecks. The ultimate result encourages a less harried and happier populace.

Data will be involved in every decision—from weather information to predict power demand, to real-time traffic information to manage incident response. As smart cars, smart phones, street lights and other connected devices act on the information, it will feed back into the system to promote timely responses and optimized prediction models for the future.

A fast, secure platform for next-generation applications and data

Whether you serve customers in manufacturing, healthcare, retail, smart cities or other vertical markets, Lumen® Adaptive Networking, Edge Compute Services, Communication & Collaboration and Connected Security enable your organization to use technology to further human progress. By taking advantage of the Lumen Platform to drive next-generation connectivity, productivity and security for your applications and data, you can reap the many benefits of actively participating in the 4th Industrial Revolution, including:



Market agility

Respond to changes in the marketplace nimbly and quickly by leveraging near real-time insights to execute data-driven decisions faster. Data that customers trust with retailers must be kept secure and safe from those looking to steal it. Data theft results in harm to brand reputation and real revenue loss, so it is essential to assure data security when customers choose to share more. Ultimately, the retail customer experience should become easier and more enjoyable, allowing retailers and supply chain partners to use data to continuously monitor and improve the selection of goods and services.



Operational efficiency

Maximize overall business productivity and speed by using analytics and machine learning to continuously improve existing processes and operations.



Accelerated innovation

Develop and launch new products and services quickly while they are relevant to the market, through the increased adoption of emerging technologies such as edge computing and robotic process automation (RPA).



Strong security

Protect the people, assets and critical data of your business through automated threat detection and proactive response.



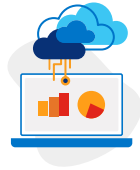
Enhanced growth

Rapidly advance business expansion by using emerging technologies such as AI, machine learning and AR/VR to accelerate core business initiative.



Differentiated experiences

Design and deliver unique customer experiences by leveraging data-driven insights about market trends and emerging technologies to create something truly different.



Adaptive Networking Adjusts to Real-Time Needs And Application Intent

The goal of the network is to connect to the needs of applications and workloads without manual intervention. The Lumen Platform is grounded in a unique global adaptive network that intelligently adjusts to real-time capacity needs, delivering scalable, high-bandwidth connectivity for data and applications. Operating one of the largest, most connected, and most deeply peered internet networks in the world, Lumen manages approximately 450,000 global route miles of fiber and 170,000 on-net fiber locations. The Lumen network offers global connections to top cloud providers, providing organizations the ability to scale bandwidth up to three times current capacity when needed.

This adaptive network can enable your business to drive greater application efficiency and performance, while simultaneously accounting for real-time usage fluctuations and long-term, scalable growth. The network is a flexible, on-demand foundation that allows full-service control and automated performance response. By having a high-performance adaptive network, your business can offer customers unique and trusted experiences. Ultimately, more efficient management of critical application data enables your business to identify market trends faster and respond more quickly with the key decisions and innovations that drive future growth.



IT Agility with Hybrid Cloud Including Edge Cloud Services

The Lumen Platform combines IT agility and edge cloud capabilities for high-performance, low-latency data and application experiences. Designed to deliver 5ms or better latency via numerous edge market nodes, the Lumen Platform delivers organizations broad capabilities to deploy next-generation technologies and applications. With dynamic connections to more than 2,200 public and private data centers around the world, the Lumen Platform offers comprehensive capabilities to maximize application performance and flexibility.

Emerging applications and technologies that increasingly define the digital landscape within the 4th Industrial Revolution requires a strong combination of high-bandwidth and ultra-low-latency network performance. By leveraging the edge computing capabilities of the Lumen Platform to move critical application data and workloads closer to where they are processed, your business can take advantage of emerging technologies to redefine customer experiences. In addition to increasing your ability to innovate and accelerate your pace of growth, you also can optimize network costs and security by prioritizing where workloads are distributed, from the premise, to the edge, to the cloud.



Communications & Collaboration Solutions Drive Productivity and Engagement

The Lumen Platform has built-in, easy-to-use communication and collaboration solutions to drive greater productivity, interactivity and engagement. The need for seamless, real-time collaboration tools has never been greater. Lumen supports these capabilities as the North American Session Initiation Protocol (SIP) Trunking services market leader¹, with the largest installed base, as well as by carrying approximately 22 billion enterprise voice minutes on average per month. Additionally, a recent study found that businesses who integrated their UCC applications and associated network services with Lumen as the single provider increased employee productivity by nearly 30%.²

Lumen communication and collaboration solutions offer your business the flexibility to adapt to the rapidly changing workplace demands of a digitally-native workforce, while maximizing the functional capabilities of your applications, regardless of device. By taking full advantage of these capabilities, you can equip your workforce with tools that drive greater efficiencies, help extend your hiring potential to a broader talent pool, and redefine your workplace culture in new and positive ways.



Connected Security to Safeguard Data and Applications

The entire Lumen Platform is reinforced with intelligent and automated threat detection and response built-in to safeguard data and applications. In addition, Lumen analyzes 190 billion NetFlow sessions and actively monitors 28,000 command & control (C2) threats daily by leveraging our Black Lotus Labs in-house threat intelligence group. That enables the Lumen Platform to block upstream threats—we currently mitigate more than 140 distributed denial of service (DDoS) attacks per day and proactively take down more than 60 C2s per month. Combined with these capabilities, Lumen Platform security empowers your business to tailor your own security policies based on individual risk assessments.

The global threat landscape is constantly adapting, evolving and growing. When combined with the increasing complexities of business IT environments using emerging applications and technologies, on-premises security solutions are no longer sufficient. Using our unique combination of vast network assets, the Lumen Platform provides exceptional visibility into the threat landscape. This visibility translates to high-fidelity threat intelligence combined with automated response, offering businesses access to a rapid threat defense embedded into Lumen Platform network services to proactively detect and block malicious traffic. With this peace of mind, your business can readily leverage the Lumen Platform for next-generation technologies, knowing your critical data and applications are secure.

¹CenturyLink (now Lumen) was named #1 in the 2019 North American SIP Trunking Scorecard by IHS Markit.

²Nemertes Research, *Employee, Customer Experience Transformations Deliver Measurable Value*, 2020.

Harness the power of the 4th Industrial Revolution with the Lumen Platform

The combination of these advanced solutions enables Lumen to offer your business an innovative platform, enabling you with access to the unprecedented technological potential of the 4th Industrial Revolution to use data, applications and secure connectivity for a sustainable competitive advantage.

Use the Lumen Platform to drive your business's market agility, operational efficiency, accelerated innovation, strong security, enhanced growth and differentiated customer experiences.

Learn more at [Lumen.com](https://lumen.com)

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