ciena.

Network Transformation Here and Now

Accelerate Your Journey to the Adaptive Network

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Welcome the future

Network operators are bringing the future to their networks today—transforming them around the world to serve the market's enthusiasm for advanced, innovative services and applications, all while making progress toward sustainability goals. Consumers are already using cloud services for everyday applications, such as competing in online games and streaming high-definition content. Businesses are moving workloads to the cloud using analytics, Artificial Intelligence (AI), and Machine Learning (ML) to develop insights about their operations and customers to improve business performance. Businesses are also using analytics-driven process automation and robotics to improve productivity, and are configuring their networks to serve employees' demands for more flexible work-from-home capabilities. Education, too, has gone high-tech, as school systems and classrooms have become more connected than ever before—from augmenting physical classrooms to completely virtual classrooms.

While a willing market is a good thing, providers must now have the capability to support high-quality bandwidth and accommodate steadily increasing, unpredictable traffic on their networks. Providers have proven their ability to meet evolving market demands over the years, but the pace of change is now faster than ever before. These pressures call for transforming networks at an accelerated pace, so the question is: How can communications, data center, and cloud providers pull this off? This eBook helps answer that question. The following pages explore the challenges facing service providers and barriers that often stifle transformation. We also share proven methodology for network transformation projects that can start small and focus on problem areas or take a holistic view and look at the entire network. This allows providers to embrace these projects with confidence that risk will be mitigated, and the process will be smooth and seamless.

Compelling forces for change

Service providers are accustomed to upgrading their networks—it's business as usual. What's different now, however, is the complexity of the task. Today, providers are facing four converging challenges: First, they must provide higher-quality—and virtually unlimited—bandwidth to customers. Secondly, they must securely ensure network and service reliability. Third, they must reduce the costs to deliver services. And finally, they must help corporations achieve their sustainability goals. These challenges are interrelated, and often service providers must tackle them all at the same time.

1. More and better bandwidth

Customer bandwidth demands are hitting an all-time high. You're feeling the impacts in your metro and core networks, which carry aggregated traffic, and at the network edge, where content is both created and consumed by end-users, both humans and machines. You need to scale bandwidth dramatically and smartly throughout the network to ensure the service availability, service reliability, and latency characteristics your customers and their applications require.

For example, customers today expect access to the cloud, high-definition content, and streaming video, when and where they choose, without constraint. Delivering this bandwidth is table stakes for providers offering services today.

The market is adopting critical new 5G applications that require high reliability and ultra-low latency, and networks must have the flexibility to securely meet these special performance requirements.

Global international bandwidth rose by

28%

in 2022.

Total international bandwidth now stands at

997 Tb/s

Representing a 4-year CAGR of 29%.[1]

In the first half of 2022, video accounted for nearly **66% of total volume** over the internet, a 24% increase over H1 2021.[2]

5G IoT use case timeline to commercialization[3]

Short term (2022–2024)			Medium term (2025–2027)			Long term (2027+)	
Enhanced video surveillance	Connected stadiums	Patient tracking/ wearables	Drones (logistics and video surveillance)	Spraying drones	Remote control heavy machinery	Digital twins	Healthcare robotics
Semi autonomous payments	Assistive robots for customer service/cleaning	Livestock monitoring	Energy, utilities, and resources sensors (mMTC)	Metaverse apps for employee collaboration	Smart airports and ports	Advanced metaverse	Autonomous cars
Connected car (infotainment)	Automated guided vehicles for warehouse/logistics	HD mapping	Industrial automation (advanced manufacturing quality control)	Smart grid (electricity and water)	Telehealth services	Connected ambulance	Fully autonomous payments
Asset tracking (mMTC)	Smart city sensors (mMTC)	Metaverse apps for retail/fashion	Smart transportation	EV charging points	AR for remote assistance	Autonomous tractors	

The IoT involves connections to billions of sensors installed in wearables, smart homes, smart cities, and other ecosystems. And then there is the metaverse, which will be a force multiplier on all these drivers. Networks must accommodate the massive, aggregated traffic generated by these interactions.

Global Data by 2026:

221 ZB

>2x in next 4 years[4]

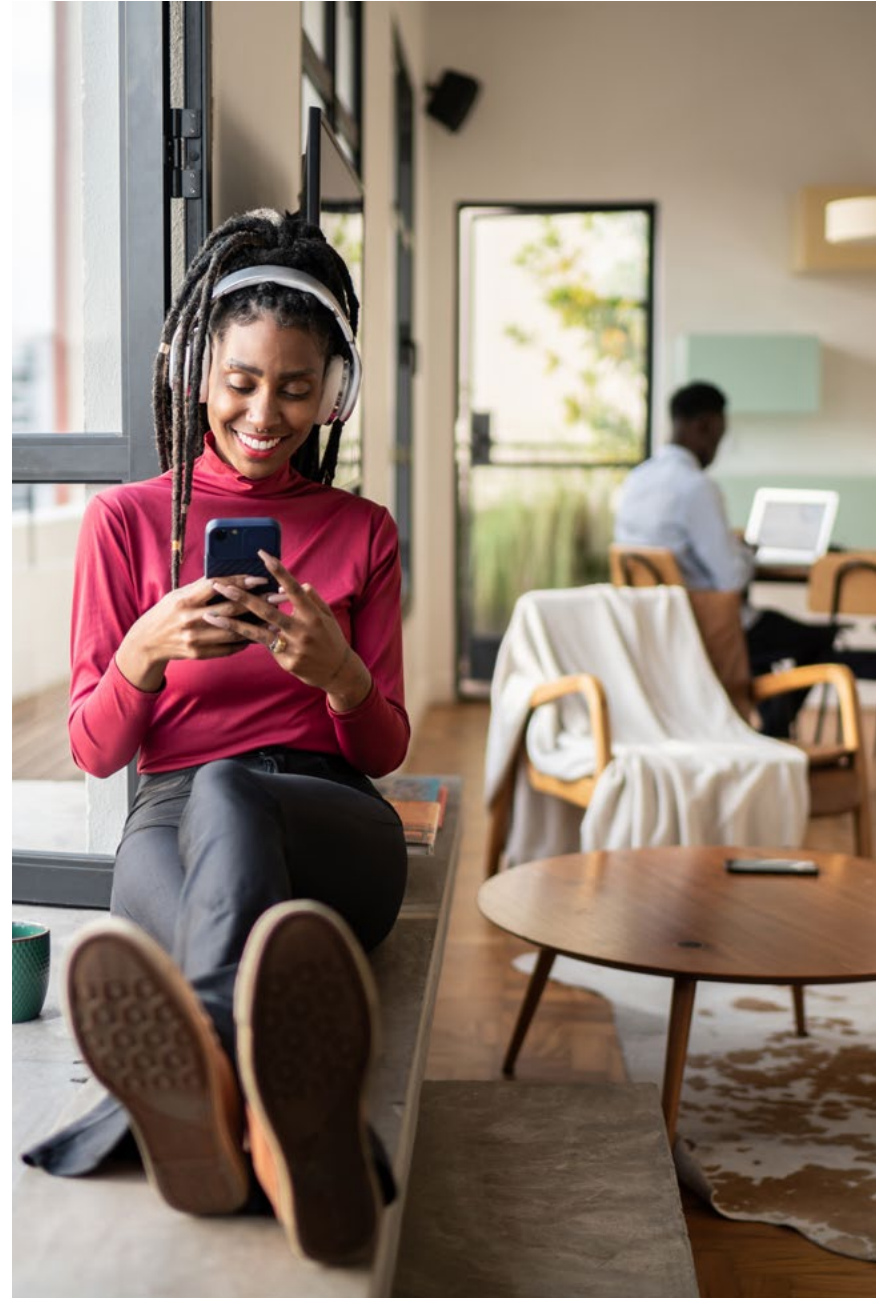| Home office	Mobile apps	Edge computing/ telco cloud	Video surveillance
Cloud gaming	Metaverse	IoT - Industrial automation	Satellite

Lack of
spare parts

Lack of
expertise

Lack of
integration

2. Ensure network and service reliability

The infrastructure providers have used for years is starting to show its age. It is power hungry, built on multiple generations of platforms, some of which are reaching end of life. Continued use of this equipment places your network at risk: You can't find spare parts, it's difficult to update or integrate legacy software, and engineers with relevant technical expertise are in short supply. And, fundamentally, the legacy infrastructure is reaching capacity limits, threatening your ability to support current and future customers. Consolidating services onto a modern next-generation network will minimize these risks while supporting traffic growth, new revenues, and sustainability goals.

3. Simplify operations and reduce costs

Providers must find ways to simplify operations so they can scale networks cost-effectively and reduce per-bit transport costs. Skyrocketing demands, combined with pricing pressures from customers that already impact margins, exacerbate this challenge. Further, legacy networks are bogged down with multiple generations of equipment, multiple Network Management Systems (NMSs), and a variety of Operational Support Systems (OSSs) and Business Support Systems (BSSs). The accumulated infrastructure complicates operational workflows, delays service provisioning, impedes troubleshooting, and requires more staff while also increasing operational expenses.

The way forward is to consolidate the multiple legacy platforms onto a new, next-gen network that runs on the latest in coherent optics, which provides dramatically more capacity and lower cost per bit. The consolidated, next-gen network can fully integrate all assets, inventory, OSS, and BSS and it's easier to visualize and manage—with fewer staff resources.

Our coherent innovation—delivering an 80x increase in data throughput (10 —> 800 Gb/s) per wavelength—has enabled immense benefits for network operators.

Systems require more capacity, while customers demand lower prices.

80x

increase in data throughput

Bandwidth

Cost

10 Gb/s ——> 800 Gb/s
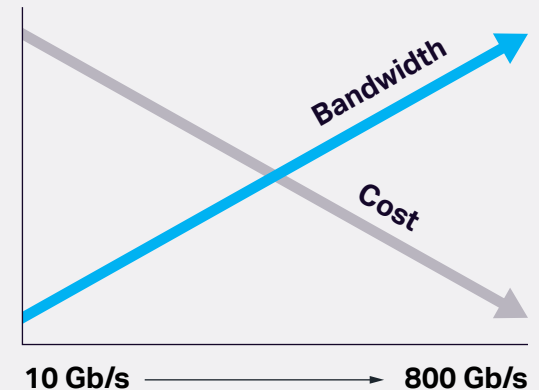
4. Support sustainability initiatives

Consumers and enterprises want to do business with suppliers who reflect their values, and sustainability is a shared concern. Many network providers have published ambitious sustainability goals, including Science Based Targets that help companies do their part to keep global warming to 1.5 degrees Celsius from pre-industrial levels. Legacy networks, unfortunately, can prevent providers from achieving these sustainability goals.

Next-gen networks provide a significant contribution to sustainability initiatives because the newer technologies come with an 85 percent reduction in physical space requirements and consume 80 percent less power per bit. The smaller hardware components use fewer raw materials, which benefits the environment, and they are also lighter in weight, which produces fewer emissions from shipping and packaging.

From WaveLogic™ 3 to WaveLogic 5 Extreme

300%
increase in fiber capacity

80%
less power per bit

85%
smaller footprint

Emissions avoided through WaveLogic innovation (2012–2021)

4.5 million metric tonnes of CO_2 avoided which equals

531,797,007 gallons of gasoline consumed or
5,228,978,502 pounds of coal burned

2x
capacity

WaveLogic 6 Extreme provides double the capacity within the same space and power and can be deployed in existing chassis for simple network evolution with fewer truck rolls.

Strive for the Adaptive Network™

Digital communications are essentially boundless today, but the services we now enjoy are just a glimpse of the future. What if you could provide a single network that could support any or all of the following?

- **Soaring demand for streaming video content**
- **Massive enterprise workloads moving to and from one or more cloud providers**
- **Mobile gigabit per second broadband for everyone**
- **High-performance online gaming for vast worldwide audiences**
- **Demand generated by the ever-increasing number of IoT devices, connections, and traffic**
- **New mission-critical wireless applications demanding high reliability, ultra-low latency, high availability, and robust security**

You have an essential role in creating this reality, and your network must be able to evolve with these demands. It must be able to grow smarter, more agile, and more responsive every day. This is the Adaptive Network. It is not a single technology, specific product, or a static networking environment, but an always-evolving system that is continually assessing network pressures and demands and adjusting accordingly. The Adaptive Network runs on a foundation of advanced hardware and software technologies enhanced by a suite of professional services. It is open, scalable, and secure. The beauty is in its versatility: It can support all service categories and use cases on the same infrastructure—now and in the years ahead.
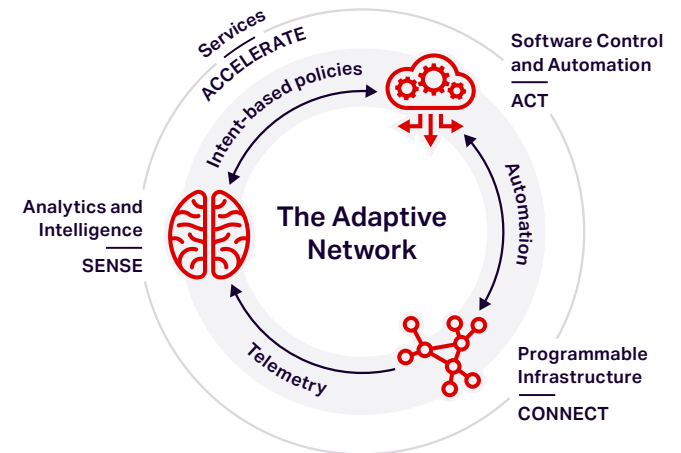
The Adaptive Network foundation

The Adaptive Network can be deployed gradually, so you can optimize your existing infrastructure while incorporating new technologies and ways of working.

The foundational elements that make up the Adaptive Network include:

- **Programmable Infrastructure (Connect)**
  A programmable virtual and physical routing, switching, and optical infrastructure is one that can be accessed and configured via common and open APIs, is highly instrumented with the ability to export real-time network performance data, and can adjust its resources as needed to meet the demands of the applications running on top of it to optimally connect end-users, humans, and machines.

- **Analytics and Intelligence (Sense)**
  Collecting network performance data via streaming telemetry, and analyzing this data using AI, provides the ability to more accurately predict potential network problems and anticipate trends by turning mountains of data into actionable insights. Leveraging these insights can help service providers develop smarter, data-driven business policies that enable them to sense and adapt to customer needs securely, and in real time, and thereby deliver new levels of service assurance.

- **Software Control and Automation (Act)**
  Service orchestration and software-defined control of individual domains are critical to adaptive networking. Through the implementation of Software-Defined Networking (SDN), Network Functions Virtualization (NFV), and open APIs, service providers can simplify the act of managing and automating the full lifecycle of their services from end to end, across multi-vendor, multi-domain hybrid networks.

- **Services (Accelerate)**
  Technical and professional services are required to help customers build, operate, and continually improve their networks, accelerating their journey to the Adaptive Network.

Foundational elements of the Adaptive Network

Business benefits of the Adaptive Network
- Flexible support for all service categories and use cases on the same infrastructure
- Dynamic adaptability to customer demands
- Better customer experience
- Enhanced competitiveness
- Reduced maintenance cost, simplified operations, and lower OPEX
- Streamlined infrastructure, less energy consumption, lower shipping costs, and reduced facility space

What's holding you back?

Network transformation can represent a big change, and it's not easy for anyone. Programs can be all-encompassing and look at the complete network or leverage a building block approach and focus on specific problem areas. Even providers with in-house planning and engineering teams struggle with the scale and complexity of these projects. Typical hold-ups include network visibility, risk tolerance, crafting the business case, and staffing.

Network visibility

Like many providers, you may struggle to achieve complete visibility of your existing network. Chances are your network was created years ago and modified along the way through upgrades, mergers, or acquisitions. You might have multiple NMSs or no NMS; OSS and BSS that are inconsistently integrated with your NMS; or network inventories that are incomplete or incompatible with one another. The lack of consistent, accurate, and credible data is the number one barrier to getting started with a transformation project. This lack of data visibility makes it difficult (if not impossible) to make fact-based decisions on where to start a transformation initiative. It also makes it hard to determine which changes will deliver maximum ROI.

Risk tolerance

As a service provider, you can't jeopardize service continuity. For years, you may have been reluctant to tinker with a reliable working network that generated high Average Revenue Per User (ARPUs). But eventually, that outdated technology increases failure rates and the likelihood of service degradation or outages because spare parts are hard to find, and repairs are often not possible with end-of-life equipment. These problems can negatively impact your customers' user experiences and place your company at risk for missed Service Level Agreements (SLAs). The problems can also impact revenue and, even worse, damage your company's reputation and brand.
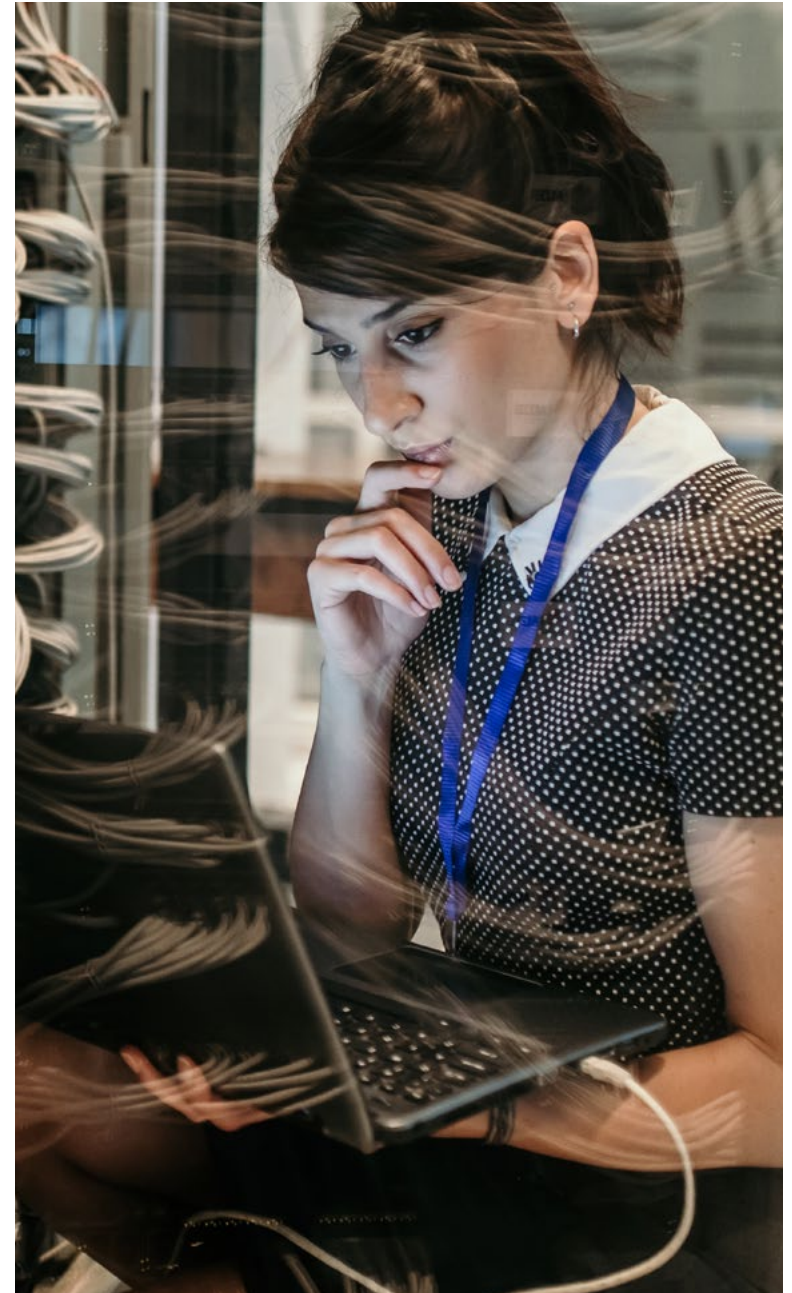
Business case

Providers often fear that network transformation might introduce financial risks. You might have trouble crafting the business case for change, defining success metrics, or calculating the ROI. Take a step back and look at the big picture. Ask yourself: If I don't transform my network now, will my company be able to stay competitive? Will we be able to deliver the services and reliability our customers are looking for now and in the future? Shouldn't I make sustainability part of our business case, since next-generation networks will dramatically lower energy requirements and reduce many other environmental impacts of delivering our services? And should I consider operational cost savings too, since a next-generation network and modern NMS can simplify operations and reduce OPEX with integrated OSS and BSS platforms?

Without answers, your company might opt to keep using your existing assets, even though transformation delays put your future competitiveness at risk.

Staff

The network transformation process can seem intimidating to service providers. The teams you have on staff can manage and operate your network, but they might not have the right skills to plan, design, and deploy the best possible next-generation network. Further, there may be a period during the transformation when you need to manage today's network as well as the new next-generation network, while migrating services to the new network. Your teams are already swamped running today's network—you can't imagine how they could do all of this at once.

Good news: These problems are solvable

The good news is that these problems are solvable and need not impede your transformation journey. A data-centric approach that leverages proven processes and customizable tools and audits, for example, can help create accurate network inventories so the process can begin with a comprehensive account of what equipment and software you've got in your network and what each component is doing. This single source of truth about your network is the most authoritative foundation you can have for strategic decision-making and prioritizing projects to ensure the best possible ROI. This vital network data will also help you determine how to offer both legacy and new services on the same infrastructure to avoid risky rip-and-replace strategies. And, fundamentally, you don't need to do this work alone. Professional services firms can step in to help by providing skilled teams who understand the challenges and can pinpoint the lowest-risk migration to the Adaptive Network.

The way forward with a trusted partner

Transformation can be a long and complex process. The best way forward is to bring in a professional services partner who can help at any stage in the journey—from initial evaluations to full deployment. A partner can help assess the best path forward to ensure optimal ROI, from taking a tactical approach that addresses urgent problem areas to a strategic approach that considers the full network. A trusted partner will be able to assume full responsibility for the process, freeing you to focus on your core business needs and most strategic business objective: Serving your customers.

What to look for in a professional services partner

Knowing how to identify the best partner for your network transformation is critical. Look for a partner who can bring the following credentials and capabilities to your project:

1. **A proven track record** deploying and transforming networks, as well as repeat business from network transformation customers.

2. **Subject matter experts** who can cover all key network layers and domains and multiple vendors' gear, and who commit to working closely with your internal management and teams through every step of the transformation.

3. **A comprehensive approach** that encompasses your network, business objectives, and business case holistically and links these together in a cohesive plan.

4. **An established methodology** for transformation projects, backed by customer references that show its effectiveness in large-scale, complex network management environments.

5. **Specialized tools, processes, and automation capabilities** that leverage data and analytics to yield the single source of truth for your network project, ensure you adopt the solution that best meets your needs, and enable you to improve KPIs while lowering your costs and risk.

6. **Willingness to assume end-to-end responsibility** for the entire project on your behalf, with flexibility to do as much or as little of the project as you require.

Learn more

For over 30 years, Ciena has supported more than

85%

of the world's largest network providers

We work with major service providers, Multiple System Operators (MSOs), and Global Content Network (GCN) providers to co-create some of the most adaptive, customer-centric networks in the world.
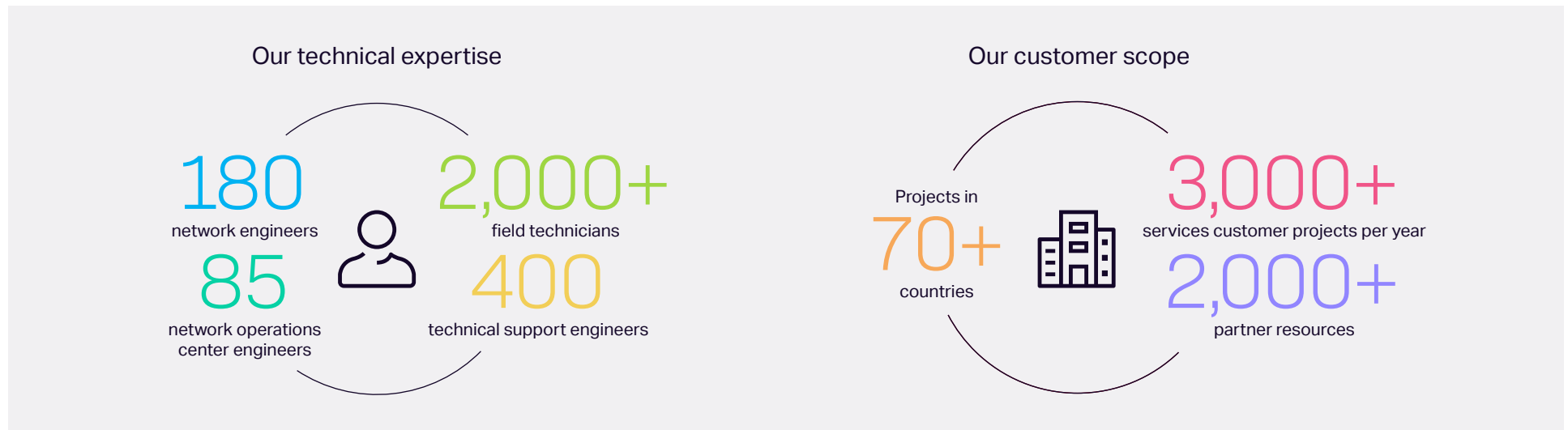
Ciena Services: Your trusted partner

Ciena is a networking systems, services, and software company. We provide solutions that help our customers create the Adaptive Network in response to the constantly changing demands of their end-users.

By delivering best-of-breed networking technology through high-touch consultative relationships, we build the world's most agile networks with automation, openness, and scale. We work with major service providers, MSOs, and GCN providers to create some of the most adaptive, customer-centric networks in the world. Our track record, unmatched in the industry, uniquely positions us to be your trusted partner. We're also committed to making a positive difference for our planet: We're on track to achieve carbon neutrality by 2024, and we're augmenting this by contributing to environmental causes. Together with our employees in 2022 alone, we donated more than $3.5 million and volunteered 36,000 hours to impactful environmental initiatives.

Our global team of experienced engineers and consultants, who are experts in large-scale migration initiatives and project management, is available to you through Ciena Services. We combine technical expertise with consulting services to ensure our relationships with providers are as open and flexible as the networks we build. To guide each initiative, we use a methodology that has been road-tested for technology transformation. We make strategic use of intelligent software tools to streamline migration, minimize risk, and make the journey a success.

Learn more

Our technical expertise

180
network engineers

85
network operations center engineers

2,000+
field technicians

400
technical support engineers

Our customer scope

Projects in

70+
countries

3,000+
services customer projects per year

2,000+
partner resources

Ciena's formula for success

The Adaptive Network does not happen overnight. It's a continuous journey that evolves as your business evolves based on ever-changing market demands; everyone begins at a different starting point depending on their current network infrastructure, market dynamics, and business objectives. Navigating this journey requires the best methodology, tools, and expertise. Ciena Services applies these capabilities to successfully transform any network environment. The migration is conducted in five phases: Strategy, Evaluation, Planning, Execution, and Closure.

Strategy

Business outcomes

Scenario analysis

Solutions determination

Stakeholders

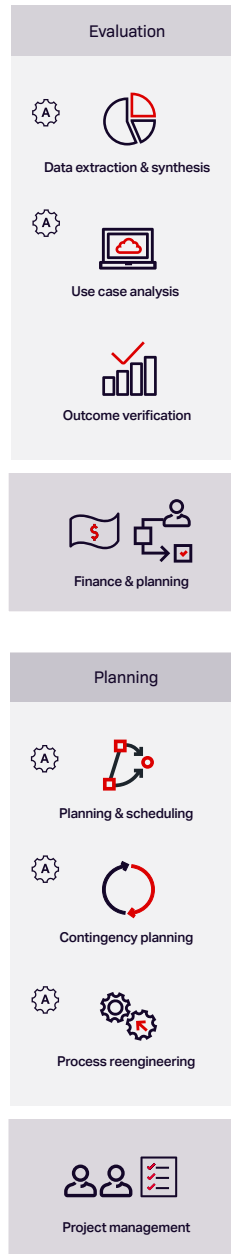*Automation and tools-enabled activities*

Phase 1: Strategy

Your network infrastructure underpins your business growth, so any change must be well planned to meet your business goals and objectives, minimize disruption, and maximize ROI. Ciena Services can craft a strategy to get you there. We work closely with you to fully understand your objectives and priorities, evaluate technologies and architectures, provide migration scenarios, recommend the most appropriate method, and build a robust business case with achievable success metrics that your decision-makers can support.

Evaluation

Data extraction & synthesis

Use case analysis

Outcome verification

Finance & planning

Planning

Planning & scheduling

Contingency planning

Process reengineering

Project management

Phase 2: Evaluation

The network evaluation begins with creating a detailed digital baseline of your network—an enriched unified database using all available network data sources ensuring data accuracy and credibility. You need this unified database—the single source of truth about your network—to inform your evaluations, plans, and decisions. Ciena's innovative analytics technology will extract and map network data from all sources, and cleanse and normalize the data to create this vital information resource. It includes all assets from legacy multi-vendor networks, finds assets that weren't previously inventoried, and identifies inventoried equipment that no longer exists. Armed with this knowledge, we're able to assess use cases, avoid project roadblocks, and create an optimal migration plan for your network.

Phase 3: Planning

The planning phase is used to determine the exact activities and processes that must be followed to achieve the optimal migration. Ciena Services project managers and engineers work closely with your technical and operations teams and other stakeholders to develop this vital migration plan that includes step-by-step Engineering Methods of Procedure (EMOPs) for every scheduled activity. The plan considers all relevant rules and requirements for service availability and maintenance window timeframes to minimize any potential customer impacts. Process reengineering and contingency planning are explored for every potential activity and added to the plan, where appropriate, to ensure mission-critical services are not compromised and operational risk is minimized.

Execution
Deployment
Migration & verification
Reporting & tracking

Communication
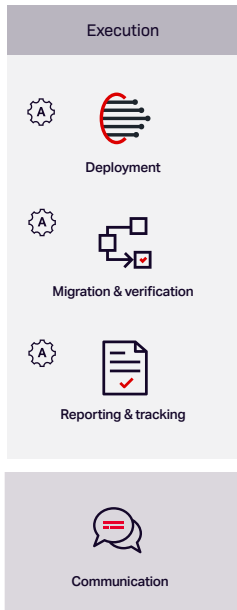
Phase 4: Execution

Execution is a critical juncture in network transformation because this is where the foundational strategy, evaluation, and planning efforts come together to enable deployment of the new network and service migration. Ciena Services draws on its expertise and experience, proven methodology, data analysis, and automation procedures to help you migrate from your legacy network to a more scalable and efficient architecture. This phase includes pre- and post-migration testing to ensure that each step in the deployment is performed properly and the network operates as it should. We accomplish this with little risk of disruption or downtime to legacy services.

Closure
OSS / BSS update
Decommissioning
Enablement

Deliverables
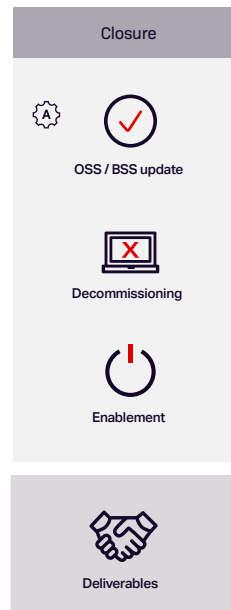
Phase 5: Closure

A variety of closure activities must be completed before a project is finished and the new network can be declared ready for service. To achieve closure, Ciena Services conducts an audit, performs OSS and BSS updates, and decommissions and removes legacy equipment. All this work is based on best practices in project management, such as the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK), and lessons learned from previous engagements. We ensure everyone is trained and we remain involved, if requested, to help monitor and guide the continuing improvement of your network. The process ensures a consistent and positive customer experience and enhances our ability to mitigate risks while achieving your strategic business objectives.

Automation and tools-enabled activities

Making it real with Ciena Services: Five transformation use cases

Service providers around the world have turned to Ciena Services to transform their networks. Here are five use cases that show how we can accelerate your journey to the Adaptive Network.

Use case 1: Network consolidation and migration

Challenge: Many service providers find that their legacy networks have become too costly and problematic to operate and can't deliver the next-gen services their customers are looking for. These networks were often put together over several years with layers of multi-vendor equipment that are at or nearing end of life. This makes them difficult to maintain because they have decreasing reliability and aren't power or space efficient. These providers need to consolidate and migrate their services onto a next-generation network to reduce risks and protect their profit margins, but they may not have the expertise or processes in house to handle such complex projects.

Solution: Ciena provides a one-stop shop to deliver entire transformation projects for service providers. Ciena Services Consulting and Implementation services teams have offered broad and deep network expertise and applied the company's well-proven transformation methodology to guide many complex consolidation and migration projects around the world. Our teams partner closely with service providers through all phases of a project—from strategy to evaluation, planning, execution, and closure—to expedite a successful, worry-free migration.

Why Ciena Services? No two projects are alike, but a recent customer experience illustrates why service providers work with us. This service provider spent a year trying to handle a complex migration project in house but found it difficult to prioritize resources on the complex and time-consuming project. It brought in Ciena, and with our expertise and methodology, we migrated multiple legacy platforms onto a single next-generation network at a faster pace than the provider could have done on its own. The service provider gained a future-proof network that mitigates legacy network risks, reduced its operating expenses (including almost $2 million in annual power savings, helping achieve sustainability goals), and simplified network management, reducing OPEX. It realized all of these benefits while allowing its internal teams to focus on their core business activities.

Learn more

Over the past 10 years

More than $2.5B

amount of Ciena investment aimed at reducing power consumption and space needed to deploy capacity

Less than 1/10 power

per Gb/s for optical transmission

Less than 1/12

product weight and size per Gb/s

5x more capacity over fiber, enabling network providers to extend the life of existing network resources

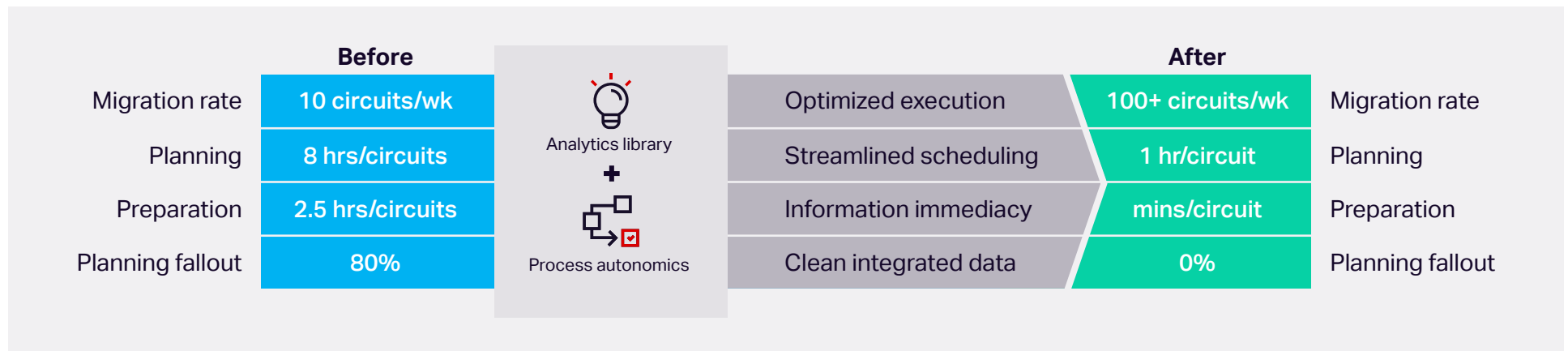# Use case 2: Migrating from non-preferred vendor equipment to an alternative network

Challenge: Sometimes a service provider must move away from non-preferred equipment suppliers due to network security, customer privacy, or regulatory concerns. If the equipment is in active use on a live network, the service provider must find a way to migrate traffic to an alternative target network without adversely impacting existing operations or the customer experience. Such vendor-independent migrations are especially complex when the target network is already deployed and operating, and uses equipment supplied by multiple vendors.

Solution: Leveraging its network transformation methodology and working closely with service provider's operations and planning staff, Ciena crafts a traffic migration and equipment removal strategy and that is efficient and cost-effective and ensures end-users are not affected during the transformation process. For a recent project, our consultants created a unified database that provided a single view of the network and leveraged field-proven analytics to automate key processes and determine the best path forward. These solutions made it possible to

reveal the best transformation paths, streamline scheduling, and guide thousands of steps used in the migration. All teams were able to work with the same information, which improved understanding, collaboration, and accuracy. The approach reduced migration planning time by 90 percent compared to the customer's benchmarks and increased the migration rate by 10 times.

Why Ciena Services? This customer selected Ciena because it demonstrated the best understanding of the business case, recognized the need to transform not only the network but affiliated processes, and offered the best methods and skills for the project along with a strategy for spreading capital expenditures throughout the duration of the project. Ciena functioned as an independent, services-only partner for the project because the equipment involved was from third-party vendors.

Learn more

	Before			After	
Migration rate	10 circuits/wk		Optimized execution	100+ circuits/wk	Migration rate
Planning	8 hrs/circuits	Analytics library	Streamlined scheduling	1 hr/circuit	Planning
Preparation	2.5 hrs/circuits	+	Information immediacy	mins/circuit	Preparation
Planning fallout	80%	Process autonomics	Clean integrated data	0%	Planning fallout

Use case 3: Fixed-grid to flex-grid migration

Challenge: Service providers are struggling to support exponential increases in network demands driven by ultra-mobile users who want bandwidth-intensive content anytime, anywhere—without paying more. To alleviate margin pressures, providers must find ways to deliver higher capacity at a lower cost per bit.

Solution: To address the challenge, service providers are deploying next-generation, higher-baud coherent solutions that transport higher data rates with less footprint, low power, and lower cost per bit. These solutions depend on having a flexible-grid network architecture in place.

Ciena is helping providers migrate from fixed-grid to flex-grid network architectures so that they can take advantage of the significant capacity improvements and cost-per-bit reductions associated with next-generation, higher-baud coherent optical technology. Ciena's approach is a step towards the Adaptive Network that enables network providers to optimize their existing frameworks while incorporating new technologies and ways of working. It is built on Programmable Infrastructure, Analytics and Intelligence, Software Control and Automation, and Services. Running underneath these components is an architecture rooted in openness, scalability, and security—positioning providers to meet steadily increasing and unpredictable consumer demands.

Why Ciena Services? Ciena has a history of pioneering coherent technologies, and Ciena Services consultants combine this experience with our proven methodology to implement fixed-grid to flex-grid transformation. We deploy the technology gradually, avoiding rip-and-replace approaches, whether starting from a fixed-grid, a flex-grid-capable, or a mixed configuration.
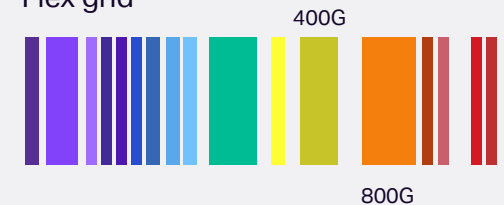
Learn more

Fixed grid

100G
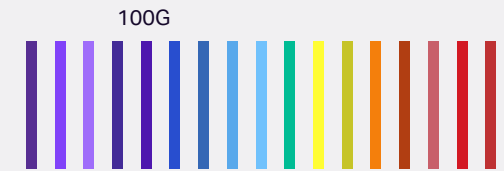
Flex grid enables up to

80%

spectral efficiency improvements[5]

Flex grid

400G

800G

Use case 4: TDM-to-packet migration

Challenge: Service providers enjoy profitable income from TDM-based private line services, but the legacy technology has become too costly to manage, maintain, and support. Providers need to migrate from TDM to a modern packet-based network without disrupting legacy services and revenues.

Solution: Ciena's TDM-to-packet solutions support both legacy TDM and modern packet-based services on a common infrastructure. Providers can continue delivering TDM services while operating a next-generation packet-optical network that seamlessly converges Ethernet, Multi-Protocol Label Switching (MPLS), IP, and segment routing connectivity and services. The architecture is the foundation of the Adaptive Network that is cost-effective, scalable, dynamic, and simple to own and operate. End-users enjoy dramatically higher-speed services and lower recurring costs at the same or better performance of legacy TDM-based services.

Why Ciena Services? Ciena Services experts have used Ciena's start-to-finish transformation methodology for hundreds of TDM-to-packet migration projects. Success metrics include migration timelines that are up to 150 percent faster, uptimes as high as 100 percent maintained throughout a project, and a 40 percent improvement in migration efficiency year over year for a three-year project.

Learn more

Estimated savings for
TDM-to-packet migration[6]

5x
lower power
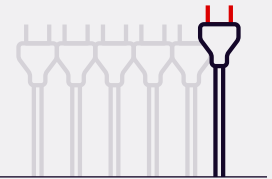
10x
space savings

Minutes
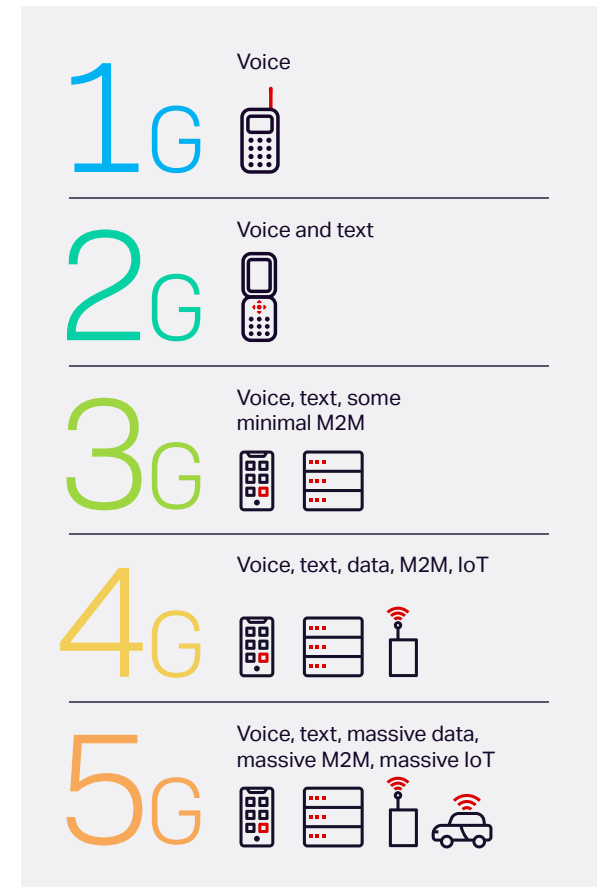to plan and provision new
services, rather than days

Use case 5: Evolving the mobile transport network for 5G

Challenge: Mobile Network Operators (MNOs) and wholesale operators are evolving from 4G to 5G to deliver order-of-magnitude improvements in data speed, capacity, and latency, along with connectivity for tens of billions of IoT devices. 5G is much more than a wireless equipment upgrade, however. It requires a new xHaul (fronthaul, midhaul, and backhaul) transport architecture that will improve network performance from end to end to support current and future subscribers, new applications, and new use cases.

Solution: Ciena 5G Network Solutions are comprised of software, hardware, and professional services. Routers specifically optimized for network slicing and the convergence of 4G and 5G xHaul transport networks enable simpler and more cost-effective network designs. Blue Planet® Intelligent Automation software enables highly differentiated mobile services implemented via intelligent network slicing and dynamic planning capabilities. To address the expected surge in bandwidth demands associated with 5G, a portfolio of industry-leading coherent optics in a variety of speeds and form-factors is provided. Finally, a comprehensive suite of professional services helps mobile and wholesale network operators along their unique 4G to 5G journeys, regardless of their 4G starting point and desired 5G destination.

Why Ciena Services? Our teams at Ciena Services help MNOs and xHaul wholesalers build their 5G infrastructure and realize the Adaptive Network. We use our proven transformation methodology, best practices, and industry-leading analytical tools to ensure the migration is smooth and successful. We can perform all necessary activities, from initial strategy consultation through implementation, along all stages of your journey to 5G. The key activities include site surveys, installation, power upgrades, third-party installation, turn-up and test procedures, migration, and site documentation, as well as ongoing maintenance and managed services after the network is activated and launched.

Learn more

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1G	Voice
2G	Voice and text
3G	Voice, text, some minimal M2M
4G	Voice, text, data, M2M, IoT
5G	Voice, text, massive data, massive M2M, massive IoT

Get started now

Network transformation can be overwhelming, but it doesn't need to be. Our approach takes a comprehensive view of your business strategy, priorities, market context, and goals, and translates them into network outcomes to enable you to efficiently deliver the results your customers are looking for. We can help you get started—from addressing problem areas in your network today to creating a complete program to address strategic needs now and into the future. Ciena Services offers industry-leading experts, field-proven analytical tools, and a proven approach and methodology to guide you through the transformation process. The journey will take you towards the Adaptive Network, an always-evolving network that continuously assesses network pressures and demands, and adjusts accordingly. The Adaptive Network is extremely efficient, so you can protect your margins and profitability while meeting customers' ever-increasing needs for more and higher quality bandwidth and your need for greater automation.

Ciena Services is the right choice as your trusted partner for this journey to help future-proof your network, with the least possible risk.

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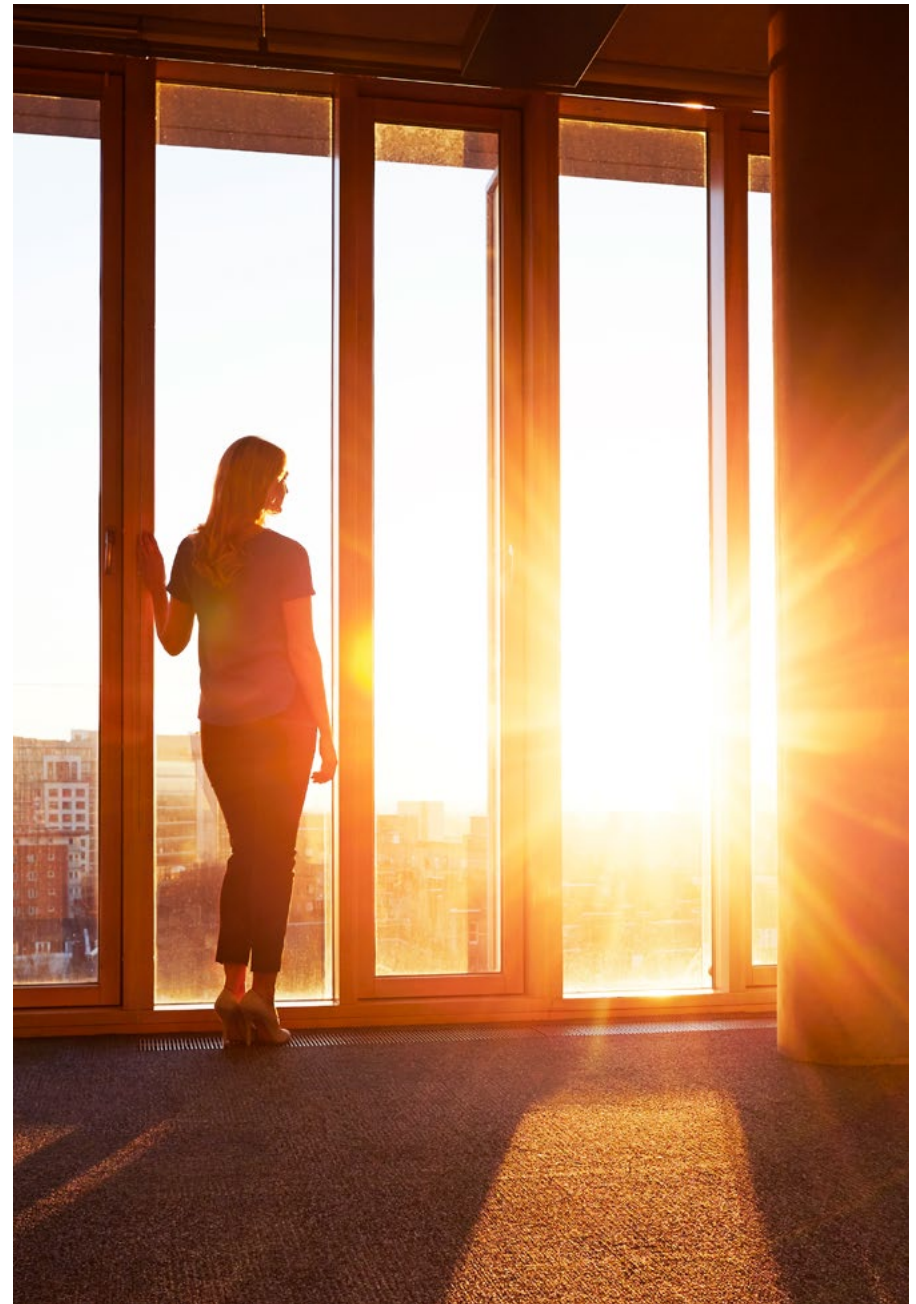
Sources:

[1] TeleGeography, "Internet Traffic and Capacity Remain Brisk", Paul Brodsky, September 2022

[2] Sandvine, "The Global Internet Phenomena Report", p. 14, Jan 2023

[3] Omdia, "An Update on 5G in IoT and Emerging Use Cases", November 2022

[4] IDC, "Global Datasphere Forecast 2023–2027", US50554523, April 2023

[5] Based on Ciena analysis

[6] Actual Ciena customer data

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