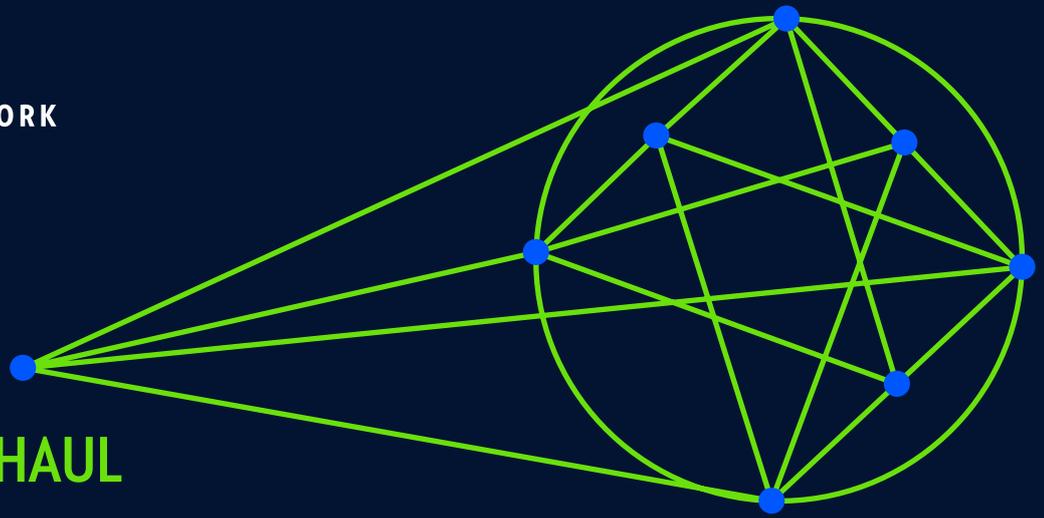**ECI** THE ELASTIC NETWORK

ElastiNET™
FOR MOBILE BACKHAUL

OPTIMIZED MOBILE BACKHAUL TO SUPPORT 5G SERVICES ON 4G INFRASTRUCTURE

The demand for mobile data is spiraling as consumers expect services, such as streamed mobile video, IoT, gaming, and augmented reality (AR). This traffic explosion places immense pressure on current 4G networks, which were designed for extensive bandwidth and coverage. However, it is not just about bandwidth. New services will have additional requirements. For example online finance and commerce, which require security and reliable connectivity. AR and mission-critical applications require low-latency responsiveness at the network edge, and the list goes on.

With the rising demand, many service providers are struggling to increase ARPU and reduce churn in an increasingly competitive landscape. In this situation, 5G networks are perceived as both an opportunity and a challenge. **The opportunity?** 5G will drive unremitting demand, an expectation of always-on services, and the potential of new revenue streams. **The challenge?** The business case for 5G and ROI are raising anxiety. The main concern is how to ensure the end-to-end service experience expected from 5G across multiple-G networks.

ECI's mobile backhaul solution is optimized for LTE and LTE-A, with the agility to evolve to support 5G as it is deployed. The ECI architecture is flexible enough to support any mobile generation concurrently from 2G to 5G. Deployed by some of the largest mobile operators in the world, our solutions have stood the test of time and allow operators to support the 5G services that customers are demanding on today's 4G network.

Support 5G Services on 4G Infrastructure:

Guarantee User Experience to Reduce Churn

- Higher Capacity
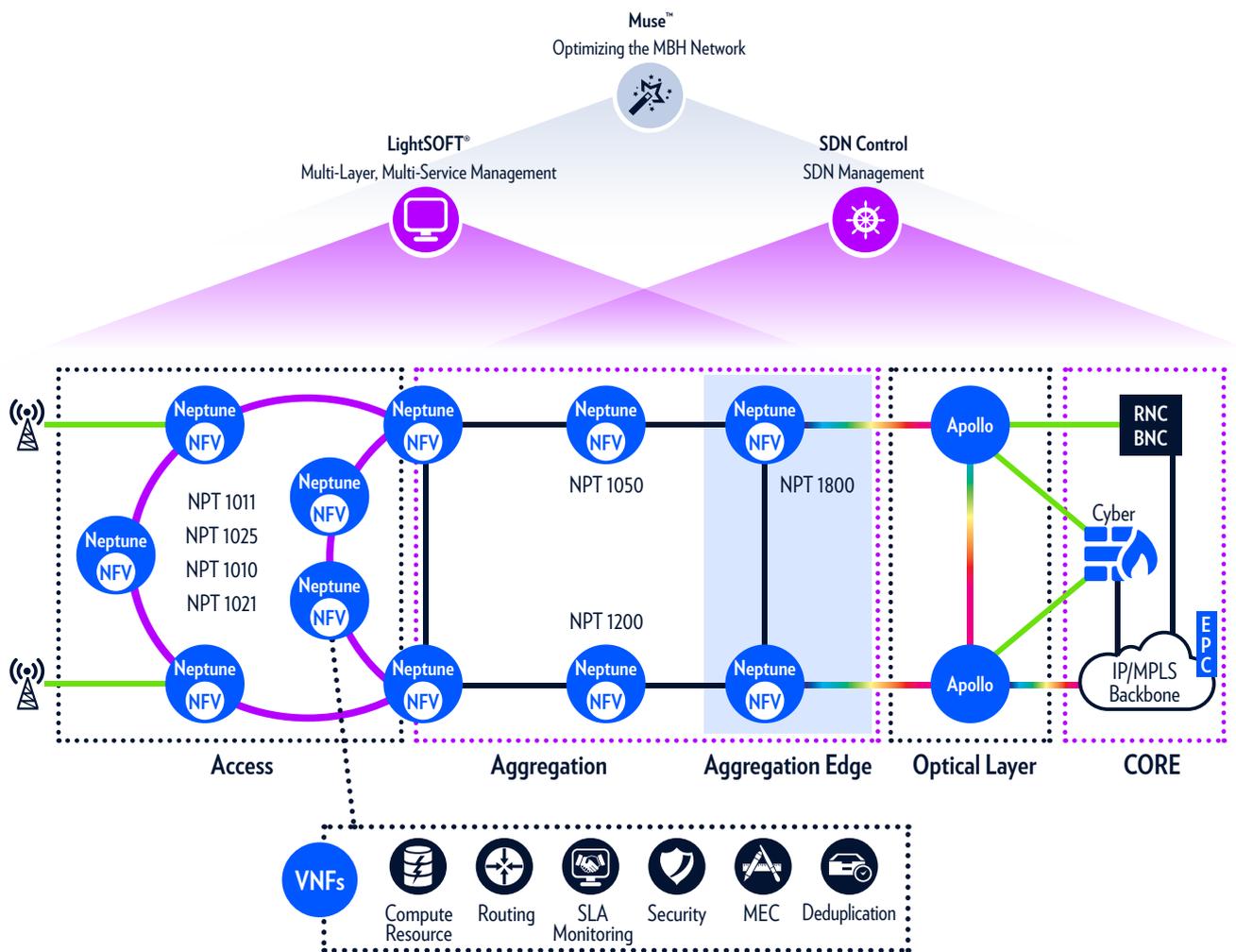- Low Latency
- Synchronization
- Service Assurance

Maximize Utilization of Current Infrastructure to Reduce TCO

- Single-Box Approach
- End-to-End Visibility & Control
- Network Optimization
- Traffic Optimization

Future Proof and Flexible to Maximize ARPU

- Integrated NFV Solutions
- Clear Evolution to SDN
- Open
- Integrated Security

From Data to Services

All analysts are talking about the growth of data traffic in mobile networks. However, data speed is not the entire issue. 5G services will begin to place a whole new set of added requirements for the mobile network.
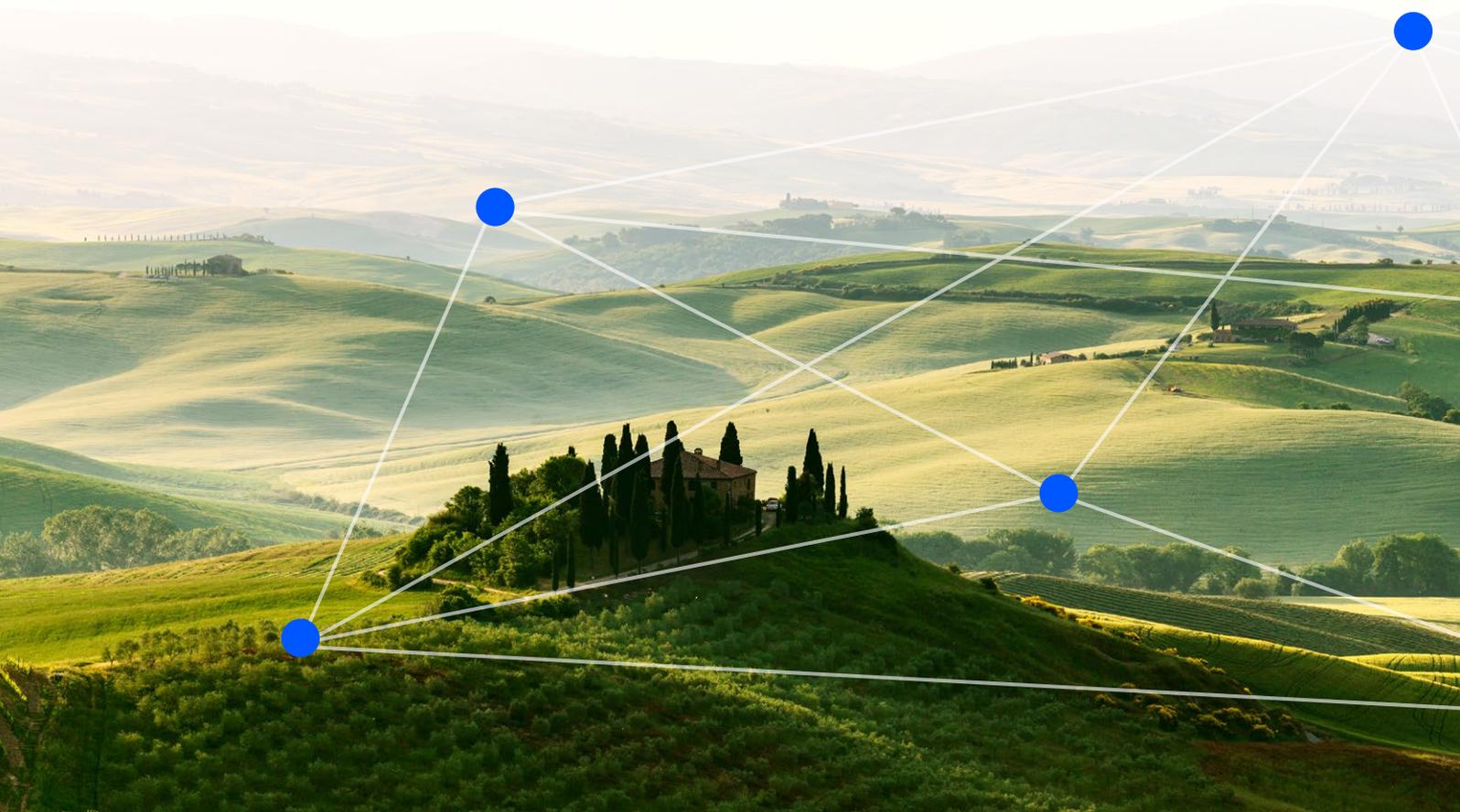
Ensuring Customer Experience – The Most Basic of Requirements

To support a new generation of mobile services, the mobile backhaul network must scale in many dimensions:

- **Higher capacity** - Mobile services will be run over many more devices, each running more applications that require more bandwidth. Today we see 10Gbps is required to the cell site. This will grow to 100Gbps in 5G. The ECI solution provides:
  - **The agility to scale from 10GbE to 100GbE** switching and aggregation in the packet layer with upgradable fabrics
  - **Reduction of traffic** by 15%-35% with deduplication
- **Latency** - Different services will have different latency requirements, from mission-critical services (which require ultra-low latency) to remote control of smart home appliances (which have no specific latency needs). As we move to 5G, the radio access network (RAN) will require latency of less than 1ms for communication between cell sites. The ECI solution is designed to meet the stringent latency requirements required for mobile backhaul:
  - **To support the X2 interface**, traffic is switched at the nearest common aggregation point and dynamic IP provides shortest-path connectivity between eNodeBs.
  - **eNodeB and EPC connectivity is supported** by Layer 3 VPNs. This allows sustained connectivity, even when the EPC evolves to a distributed model.
  - **Embedded NFVI** capabilities allow compute resources to be located closer to the user, decreasing latency.

- **Synchronization** – Efficient, cost-effective, distribution of synchronisation is already key in today's networks and will become more important as it is required to support time-specific services like traffic flow management. ECI's solution:
  - **Provides GPS receivers** in the cell-site routers
  - **Supports distribution of the timing** using SyncE for physical layer synchronization
  - **Supports 1588v2 Precision Time Protocol** (PTP) for packet-based time-of-day-based synchronization.
- **Service Assurance** – To monetize new services, service providers inevitably must be able to assure SLA's and ensure zero impact from activation of new services. ECI solutions ensure five 9's resilience with a variety of solutions across all layers, including multivendor solutions:
  - **Fully redundant equipment**, with an extensive set of protection and resiliency schemes
  - **Multilayer restoration and resilience**, and automatic remote data replication (RDR)
  - **ECI's intuitive NMS** – provides multilayer intelligence, end-to-end, across all nodes.
  - **SLA module** lets you know in real time how you are meeting SLA's:
    - For both ECI and 3rd-party equipment
    - For both current and future SDN environments
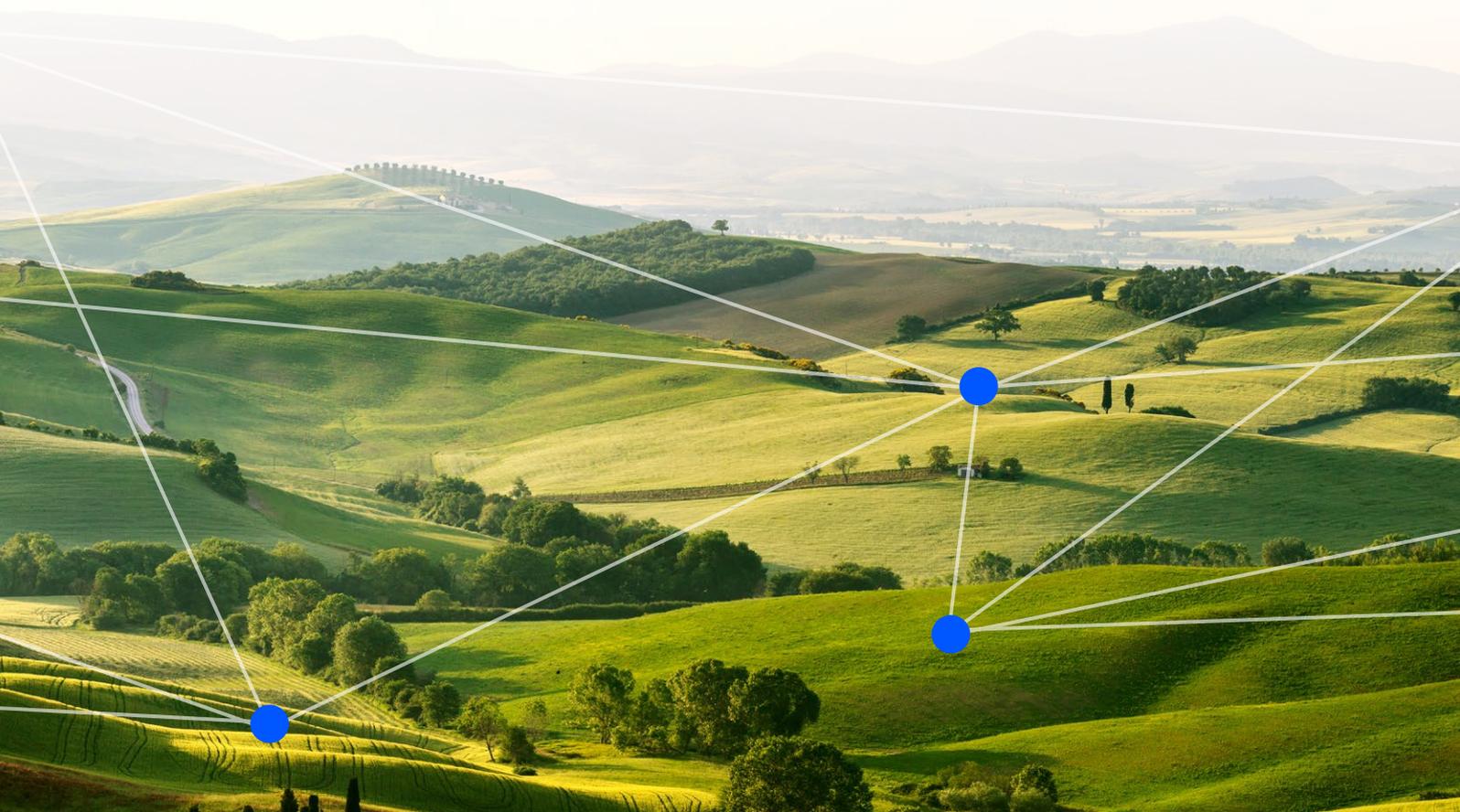
Maximizing Your Current Infrastructure to Reduce TCO

With increasing competition, the predominance of flat rates, and declining ARPUs, the investment in 5G infrastructure and the resulting ROIs seem questionable, at best. To ensure you are getting the best return on your investment you must leverage your existing resources to the max. ECI's solutions give you multiple options for doing so:

- **Single Box Approach** - to facilitate cost-effective installations, ECI solutions are flexible and support full multiservice needs.

  - **Any-G mobile backhaul** - allows legacy 2G and 3G services to co-exist with LTE on the same transport network. Legacy services can be supported natively or gracefully migrated to packet with Circuit Emulation (CES).

  - **Unparalleled multiservice equipment** - incorporates a variety of L1-L3 functionality. Integrated optics, including DWDM, OTN, and muxponders, ensure efficient and seamless interworking with the optical backbone.

  - **Elastic MPLS** - allows the operator to use the optimal technology (IP/MPLS or MPLS-TP) for their backhaul architecture and facilitates interworking with the IP Core. L3 routing is used where it is required and L2 transport is used to provide deterministic control and enhanced OAM.

- **End-to-End Visibility and Control** - facilitated by a number of unique ECI tools and systems that make sure the network is being utilized to the maximum capacity:

  - **Intuitive Plug-and-Play NMS with full FCAPS** – features a multidimensional, multilayered, multivendor approach to managing converged networks. Particularly beneficial for effortless, end-to-end service activation and reducing mean time to repair (MTTR).

- **Suite of applications** – increases network efficiency and reduces time to market for new services. These include a consolidated network intelligence view for inventory, SLA, network status, and security for both ECI and 3rd party equipment.

- **Multilayer traffic engineering** – genuine multivendor services provide network operators with the insights required to properly maintain, design, and re-engineer the network.

- **Network Optimization** – With the insights derived from the above systems, the network operator has the knowledge needed to optimize the network. Here, another batch of systems and applications come into play:

  - **Workflow automation** - intuitively automates the workflow of common network operation tasks, many of which are still executed manually. ECI estimates a possible cost savings of 20-30% on routine tasks.

  - **Proactive maintenance** – ensures your network is at its peak by continuously and proactively monitoring the health of the network to preempt potential failures and ensure network reliability.

  - **Multilayer provisioning, real-time optimization, and path restoration** – all of which are part-and-parcel for modern networking.

- **Traffic Optimization** – New services require added bandwidth and traffic patterns are becoming more migratory, while traffic density changes throughout the day as the users move. To optimize network utilization, backhaul capacity needs to move with the users. ECI's solutions enable:

  - **Scheduled or Automated Bandwidth-on-Demand** – is available today, to allocate bandwidth when and where needed, in a simple, intuitive app or via automated procedures.

  - **Deduplication** - takes the caching concept to the next level and provides a specialized data compression technique for eliminating unneeded duplicate copies of data. Deduplication reduces backhaul traffic by 15%-35%.

Flexible Future-Proof Solutions Ensure Your Investment for the Long Term and Provide Agility to Maximize ARPU

5G services will no doubt have a major impact on network architecture because for the first time, SDN and NFV will be a prerequisite. The sheer amount of traffic and the different types of traffic on the network will require a different mode of operation. Automated, self-organizing networks - who some refer to as 'cognitive networks' - will become a must. ECI understands your immediate needs for new network capabilities and that you cannot wait for 5G. This is why we designed all of our solutions to be future-proof and forward-looking, including:

- **Integrated NFV Solutions** - Embedded NFVI, provides Mobile Edge Computing (MEC) capabilities in the network, allowing compute and storage to be placed where it is needed. This reduces latency and allows rapid, low-cost introduction of new services.
- **Clear Evolution to SDN** – End-to-end SDN capabilities for a multilayer, multivendor ecosystem that supports extreme new service requirements with current capabilities of bandwidth on demand, service scheduling, and automation.
- **Open** - Our systems already incorporate open interfaces and APIs to ensure that our solutions be completely interoperable in 3rd party environments. Also, we make sure that our management systems can integrate 3rd party platforms, improving your visibility and control in multivendor environments.
- **Integrated Security** - ECI's award-winning security solution provides a comprehensive system with a rich set of mature and innovative security services, including advanced firewall, breakthrough Intrusion Prevention (IPS), URL Filtering, anti-malware, and more. Moreover, our multitenant solutions enable service providers to leverage their own security infrastructure for additional revenue streams, like Security-as-a-Service and SOC-as-a-Service.

Guaranteed User Experience to Reduce Churn

YOUR CHALLENGES	OUR SOLUTIONS
Higher Capacity	• The agility to scale from 10GbE to 100GbE switching and aggregation in the packet layer • Upgradable packet fabrics (e.g. 10G to 60G, 500G to 1.4T) • Reduction of traffic by 15%-35% with deduplication
Latency	• Traffic switched at the nearest common aggregation point to support the X2 interface • Dynamic IP provides shortest-path connectivity between eNodeBs • The eNodeB and EPC connectivity is supported with Layer3 VPNs • Embedded NFVI capabilities allow compute resources to be brought closer to the user
Synchronization	• GPS receivers in the cell-site routers • Distribution of timing using SyncE for physical layer synchronization • Supports 1588v2 Precision Time Protocol (PTP)

Service Assurance	• Fully redundant equipment, with an extensive set of protection and resiliency schemes
	• Multilayer restoration and resilience & automatic remote data replication (RDR)
	• Intuitive NMS – provides multilayer intelligence, end-to-end, across all nodes
	• SLA module tracks and monitors SLAs in real time
	   • For both ECI and 3rd party equipment
	   • For both current and future SDN environments

Maximize Utilization of Current Infrastructure to Reduce TCO

YOUR CHALLENGES	OUR SOLUTIONS
Single-Box Approach	• Provide Any-G mobile backhaul – supporting legacy services natively or by migrating them to packet • Unparalleled multiservice equipment incorporates a variety of L1-L3 functionalities • Elastic MPLS - uses optimal technology (IP/MPLS or MPLS-TP) for the backhaul architecture and facilitates interworking with the IP Core
End-to-End Visibility and Control	• Intuitive plug-and-play NMS with full FCAPS – allows end-to-end service creation and reduces mean time to repair (MTTR) • Suite of applications – to increase network efficiency and reduce time to market for new services • Multilayer traffic engineering – provides network operators with the insights required to properly maintain, design, and re-engineer the network
Network Optimization	• Workflow automation - intuitively automates the workflow of common network operation tasks • Proactive maintenance – continuously and proactively monitors the health of the network • Multilayer provisioning, real-time optimization and path restoration
Traffic Optimization	• Bandwidth on Demand – allocates bandwidth where and when it is needed • Deduplication - deduplication reduces backhaul traffic by 15%-35%

Future Proof and Flexible to Maximize ARPU

YOUR OPPORTUNITIES	OUR SOLUTIONS
Integrated NFV Solutions	Embedded (or standalone) NFV solutions allow compute and storage to be located where they are needed
Clear Evolution to SDN	Ensures that your investment is able to evolve to SDN, whenever you decide
Open	Open interfaces and APIs to ensure equipment is completely interoperable
Integrated Security	For your own protection and to increase revenues

ECI has extensive experience in rolling out vast mobile backhauls network in cost sensitive, harsh, environments. Please contact us to discover how we can support your mobile backhaul needs.

ABOUT ECI

ECI is a global provider of ELASTIC network solutions to CSPs, utilities as well as data center operators. Along with its long-standing, industry-proven packet-optical transport, ECI offers a variety of SDN/NFV applications, end-to-end network management, a comprehensive cyber security solution, and a range of professional services. ECI's ELASTIC solutions ensure open, future-proof, and secure communications. With ECI, customers have the luxury of choosing a network that can be tailor-made to their needs today – while being flexible enough to evolve with the changing needs of tomorrow. For more information, visit us at **www.ecitele.com**