

**SOLUTION BRIEF**

# 5G Automation - Network Slicing

## Automating End-to-End slice lifecycle management

### Business challenges

5G is driving a massive transformation in the world of mobile networks. It promises consumers a whole new connected experience, while offering a broad range of industries unprecedented potential for business and revenue growth. As consumers, enterprises, governments, and many others continue their digital transformation, Mobile Network Operators (MNOs) and Communications Service Providers (CSPs) can accelerate this journey by building a reliable and performance-driven 5G network that is agile, scalable, and cost-efficient.

But the transition to a 5G network is also complex. The 5G journey involves building a new network that can cater to new industry verticals, innovative business models, and other yet-unknown demands from services and customers. This requires a fresh approach to how a network is designed, delivered, and managed. 5G networks will be designed to provide ubiquitous connectivity at superfast data rates and ultra-low latency. The networks must be highly reliable and flexible to support myriad services from diverse industries, each delivered over distinct slices of the network. And finally, MNOs and CSPs should be able to activate, modify, and scale numerous 5G services over these slices, each tailored to specific performance and customer requirements—not in days or weeks, but minutes.

Automation will play a vital role in the operations of 5G networks, especially with the creation of network slices. A network slice is a logical end-to-end network defined over virtualized resources that run on top of a common physical infrastructure. Each slice is isolated from another and is designed according to the specific needs of the application or user, including speed, capacity, latency, security, and topology. The

### BUSINESS IMPACT

The Blue Planet<sup>®</sup> 5G Automation - Network Slicing solution provides MNOs and CSPs intelligent and automated lifecycle management of network slices.

- Accelerate time-to-market for new on-demand, network slice-based services to monetize your 5G investments
- Open, standards-based solution aligns with 3GPP and ETSI NFV MANO framework and supports related TMF and MEF Open APIs
- Simplify and accelerate your 5G network buildouts—be it physical or logical devices, VNFs or CNFs—from the RAN to the 5G core
- Use proven intelligent automation to gain advantage in a highly competitive landscape
- Reduce costs and simplify operations with zero-touch slice lifecycle automation
- Quickly meet customer demands, and increase revenue with a reliable and scalable 5G network
- Assure network slice performance and adhere to service SLAs to ensure customer satisfaction, and gain upsell opportunities

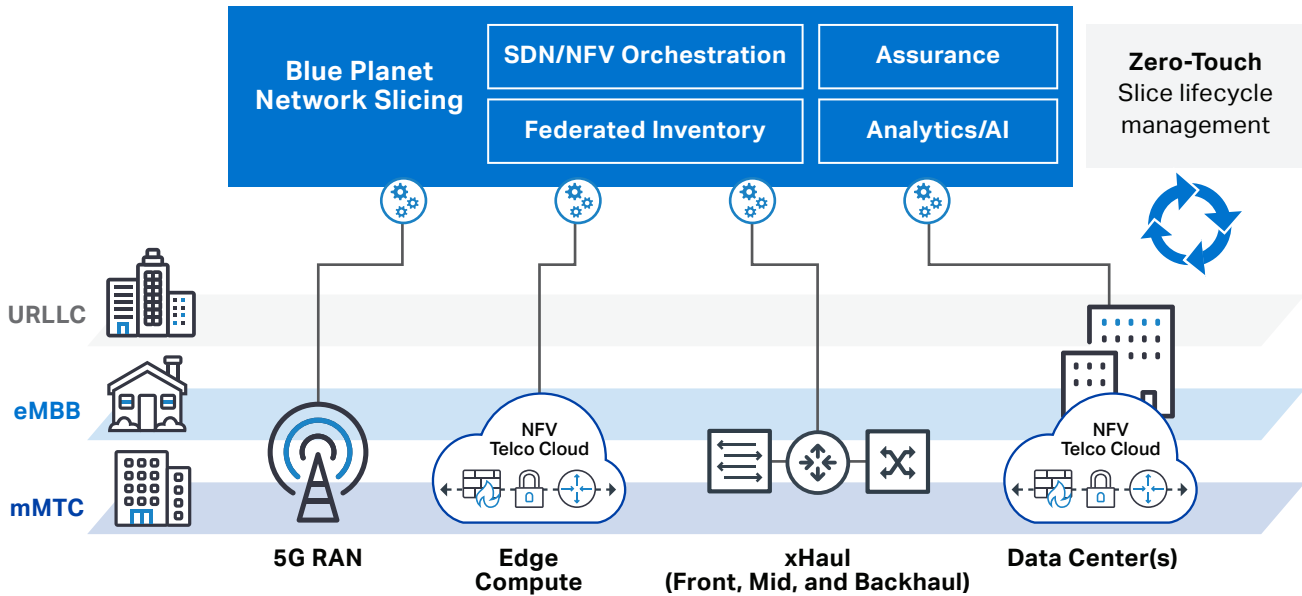


Figure 1. Blue Planet Network Slicing solution architecture

slice allocates guaranteed resources to an application, service, users, or an enterprise based on their requirements, and therefore plays a key role in building an agile, scalable, and cost-efficient 5G network. A provider may require many thousands of network slices to cater to a multitude of services from their hundreds of customers.

Because network slicing is critical to the successful delivery of 5G services, MNOs and CSPs should have the ability to quickly plan, design, and activate thousands of customized network slices across their RAN, transport, and 5G core. They should be able to scale up or down a slice, assure performance, and enable it to handle evolving service or customer requirements, all in real time.

How can MNOs and CSPs instantly plan, design, activate and assure thousands of network slices when required? How can they scale slices within minutes, with minimal human intervention to meet service requirements in real time?

### Blue Planet 5G Automation - Network Slicing: Purpose-built for zero touch

Blue Planet 5G Automation - Network Slicing is a standards-based, vendor-agnostic intelligent automation solution that helps MNOs and CSPs accelerate their journey to 5G. With Blue Planet Network Slicing, MNOs and CSPs can enable zero-touch slice lifecycle automation, which includes planning, instantiation, and operations of end-to-end (E2E) network slices across the RAN, transport, and core domains.

In addition to supporting the 3GPP Communication Service Management Function (CSMF) and end-to-end Network Slice Management Function (NSMF) standards, the Blue Planet Network Slicing solution is built with Network Slice Subnet Management Function (NSSMF) capabilities for slicing in multi-vendor packet-optical transport and 5G core networks. With its multi-layer Path Computation Element (PCE), and support for both hard slicing (ex. FlexEthernet and OTN) and soft slicing (ex. Segment Routing) and analytics, Blue Planet provides on-demand, end-to-end control, and assurance for transport network slices.

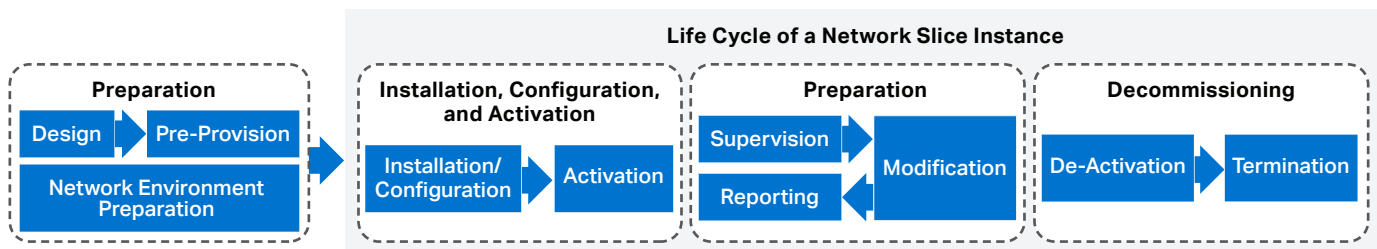


Figure 2. 3GPP network slice lifecycle management supported by Blue Planet

The Blue Planet Network Slicing solution is key to the proper placement of VNFs and CNFs within a mobile network and enabling operators to maximize the utilization of network resources by reallocating unused resources to other slices. This zero-touch solution interfaces with the entire network for the creation of generic slices such as Ultra-Reliable Low Latency Communications (URLLC), enhanced Mobile Broadband (eMBB), and massive Machine Type Communication (mMTC), or custom slices across the RAN, transport, 5G core, and cloud domains. With its advanced analytics, Artificial Intelligence (AI), Machine Learning (ML), and automated orchestration features, the Blue Planet solution enables the creation of a self-driving, self-healing, and self-optimizing 5G network with zero-touch capabilities.

### Zero-touch network slice lifecycle management

The massive number of network slices that will be used, and the speed at which these services must be managed, make it impossible for operators to accomplish slice lifecycle management manually. Zero-touch automation is a necessity to efficiently manage the lifecycle of network slices.

Blue Planet Network Slicing can automate the entire lifecycle management of end-to-end network slices and includes support for GSMA Slice Template for the initial design phase. Using this solution, MNOs and CSPs can plan, design, and create new network slices, monitor and modify a slice to meet Quality of Service (QoS) or customer requirements, assure its performance, deactivate it when no longer required, and release associated resources back into a federated inventory system.

### Rapid service deployment

As 5G adoption increases across new industry verticals, explosive growth in the number of services is expected. Businesses will demand faster deployment of new services that meet their custom QoS requirements. With 5G expected to expand the competitive landscape, customer churn is inevitable if their demands are not met. The Blue Planet Network Slicing solution—featuring networkwide correlated analytics, automated orchestration, and zero-touch capabilities—can help MNOs and CSPs reduce the time to plan, design, and deploy new services across the multi-layer, multi-vendor, multi-domain network from weeks or months to a few minutes. The rapid deployment capability reduces the time to market for service offerings, increases customer satisfaction, and shortens the time to revenue for the operator.

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**Dynamic Planning for 5G Networks**

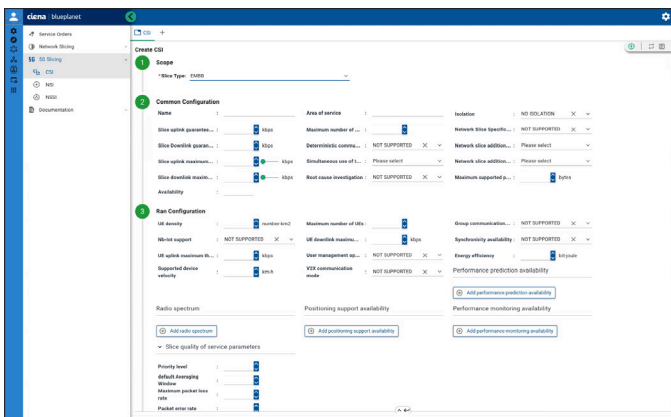


Figure 3. Define standard or custom parameters for your slice with Blue Planet Network Slicing

### Open and standards-based

The Blue Planet software portfolio supports a wide range of industry standards initiatives, open-source projects, and Open APIs from the TM Forum, MEF, ONF, and others. Aligned with this approach, the Blue Planet Network Slicing solution is designed based on the ETSI NFV MANO framework and supports TMF APIs for service order management and orchestration. The solution also includes 3GPP defined CSMF, NSMF, and NSSMF functions for E2E network slicing.

Additionally, to adhere to emerging 5G standards, this Blue Planet solution is designed and developed as a cloud-native application built on a container and microservices based architecture.

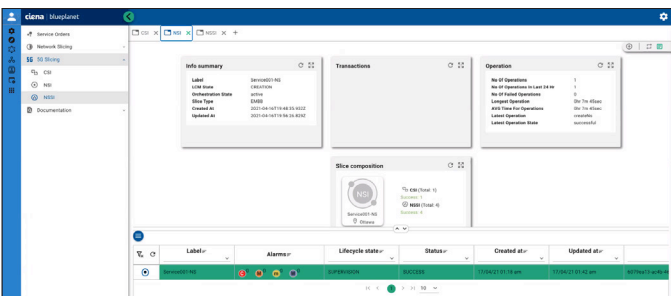


Figure 4. Blue Planet covers the entire lifecycle of a slice - from activation to supervision state

## Business outcomes

Using the Blue Planet 5G Automation - Network Slicing solution, MNOs and CSPs can reduce the time to market for new services, assure service performance, increase revenue, and stay ahead of the competition. AI- and ML-enabled automation ensure error-free deployment of new services, smarter self-healing capabilities, efficient and optimized use of network resources, and even help free human resources from manual and repetitive tasks associated with planning, design, and deployment.

The solution includes features to automate the orchestration and activation of dynamic E2E network slices across the RAN, transport, 5G core, and cloud; seamlessly scale bandwidth requirements of 5G deployments; optimize the network to enable

better load-spreading; and assure customer experiences are constantly optimized for their varied requirements.

The combination of Blue Planet 5G Automation - Network Slicing with Ciena's programmable packet-optical network solutions allows MNOs and CSPs to realize zero-touch planning, design, and operations—ensuring reliable delivery of new 5G services, with minimal manual intervention in the shortest possible time.



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