Intraway

Leading the Way for 5G - Small Cells Deployment

Introduction: The impact of codeless provisioning automation in small cells deployment

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To comply with the growing demands on mobile networks, distributed virtualized network architectures provide significant scaling advantages and flexible deployment options. An example of this is the use of small cells in fixed broadband access networks to scale the capacity and coverage of cellular networks.

Installing Small Cells Should be as Easy as Installing Wi-Fi
Cost-Effective: Install a few extra and avoid the need for precision RF planning
No Special Skills: Automatic self-organizing and configuring avoid the need for skilled technicians
Scalable: Same equipment suitable for the smallest to the largest buildings
Device-Compatible: Works with any 3G or 4G smartphone

Small cell deployment mainly solves coverage problems for business clients. Nonetheless, it can be used both in business and residential scenarios with any type of Backhaul (ADSL, Cable, or Fiber) to treat coverage or capacity issues.

Here we discuss provisioning of small cells, access networks, and virtualized functions, orchestrating through various inventories, network systems, and elements involved in the provisioning automation. We will talk about how the automation and standardization of the small cells provisioning ensure the quality (reducing the manual turn-up/activation issues considerably), speeds up the deployment (allowing operators to reach 10x increase factor without hiring additional staff), and how the automated provisioning and configuration of the virtualized infrastructure and network elements provide network elasticity, expanded coverage and enhances QoE at an attractive cost.

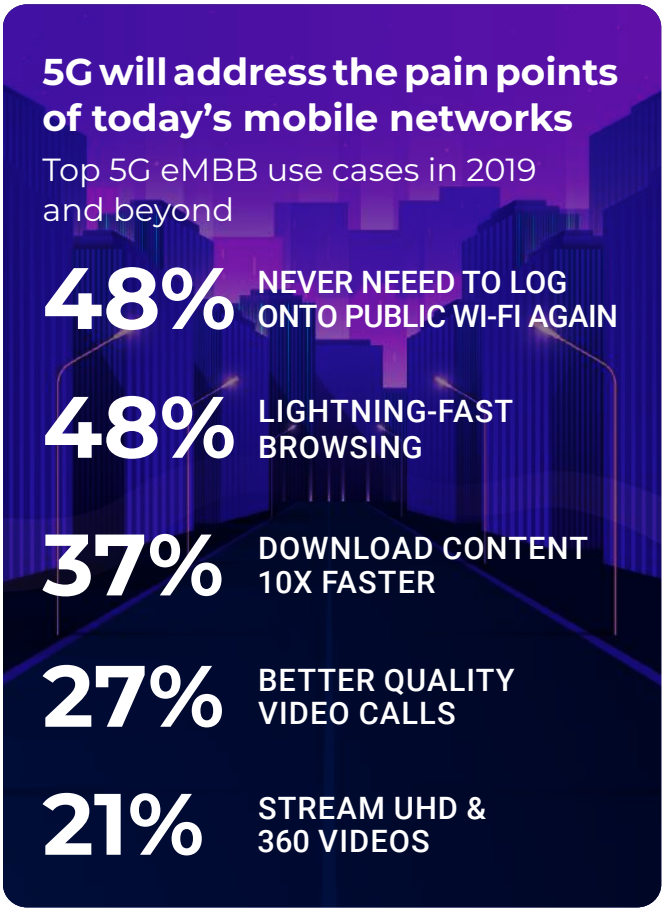
By reducing the dependency on specialized hardware, operators can also expect to lower Capex and Opex while they speed up service delivery, allowing scalability on demand and responding to the network conditions and user needs in real-time, this way opening the way for 5G and dynamic services.

The Scenario

5G and IoT are setting high expectations in the customer's mind, raising the bar for service providers. The business case is centered on augmenting the wireless coverage for billions of connections and providing low latency. The only way to achieve that is by deploying hundreds and even millions of small cells efficiently and on-time.

Assuring that those small cells and backhaul links will meet service level agreements at turn-up presents a new challenge. Traditional manual provisioning and testing methods are simply impractical for current and future needs.

5G is the next-generation mobile networking standard that will build on the global 4G Long Term Evolution (LTE) ecosystem. Its promise goes well beyond high-data rates, spectral efficiency, ultra-low latency, or massive sensor networks. It enables new service opportunities – from just people communicating on phones to fast real-time low latency data transmission between things.



With the landscape of 50B IoT devices connected to the network by 2023[1], on-demand remote provisioning and management of mobile connectivity is going to be a key factor in catapulting this business to the next level.

Small Cell Deployment Challenge

The current fulfillment and assurance processes in mobile operators were designed for macrocells. Those processes limit the deployment of cells to around 10/15 cells per day. To meet a goal of 25,000 or even 100,000 in the spam time needed, operators need to scale to at least 100 cell deployment per day. Adding additional staff (or contractors) is not an option.

The deployment entails complexities such as provision IP backhauls from different access technologies (DOCSIS, GPON, ADSL, etc.), support different network equipment vendors (interoperability), and off-net providers with various technologies.

At a higher level, the small cell deployment and turn-up can be summarized in:

- Deployment preparation
- Service installation
- SLA monitoring and maintenance

Deployment challenges at each stage are described in the figure below.

Everything is Connected

From 'Smart Appliances' to 'Smart Cities', we will live in a world where everything is connected. We will have better information, more control, and insight into everyday things. With sensors everywhere, systems will be able to keep running autonomously.

Every device you own – and some you don't even know, will soon be an instrumental part of your everyday life – will be connected to the Internet. IoT will transform everything we know in the coming years.

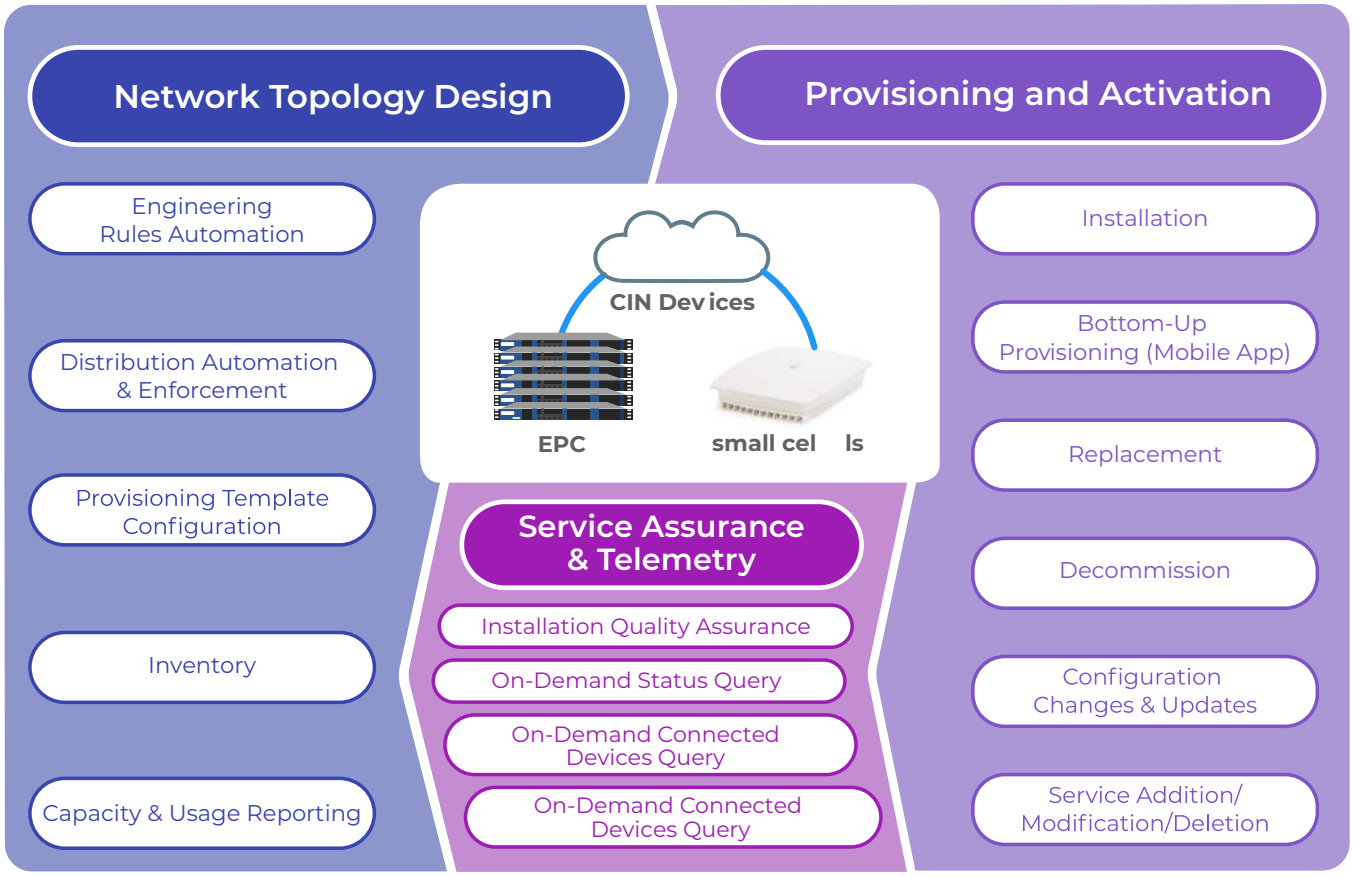
From the way we do business to how we manage our household life, our health, security, manufacturing, and even our cities will be powered by IoT connectivity.

Deployment Preparation	Service Installation	SLA Monitoring and Maintenance
Complex design and management tasks	Failure to install on time (Turn-up/Activation issues)	No visibility into service performance
Planning based on spreadsheets that are prone to errors	High percentage of turned up broken (Dead on arrival)	Multiple dispatches to find then fix (Many truck rolls)
	Lack of visibility in the final service delivered Customer dissatisfaction)	Large level of effort to isolate troubles (Large mean time to repair)

Small Cell Deployment Challenge

[1] Internet of Things - The number of connected devices worldwide 2015-2025. Published by Statista Research Department, Nov 14, 2019, https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/

MULTI-VENDOR SMALL CELL AUTOMATION

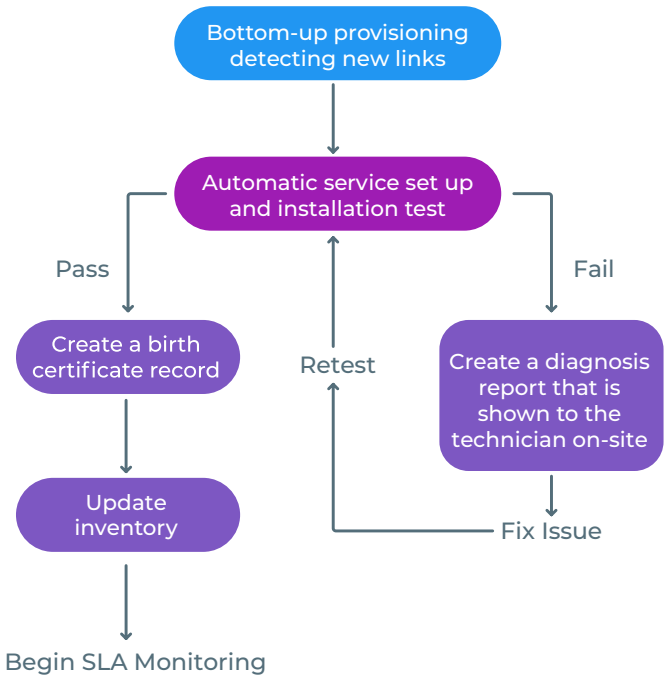


Small Cell Deployment Automation

Based on codeless lifecycle service automation and closed-loop assurance, Symphonica automates the small cell turn-up. It offers clear SLA Installation visibility, which automatically benchmarks service quality levels and alerts the technician about any deviations from established benchmarks.

Where previously a technician had to dig through new services and manually configure the equipment and tests, Symphonica enables the operator to automate the service deployment process so that most small cells could be activated automatically.

An integrated solution allows the mobile operator to manage the life cycle of small cells in a mobile network on top of simple device provisioning. This is:



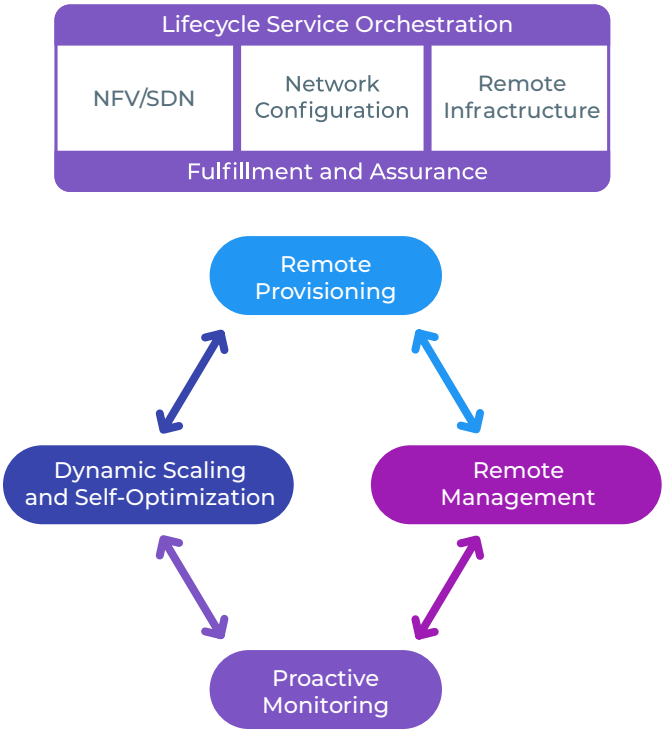
- Control and automate the E2E fulfillment process
- Keep an active inventory of implemented elements
- Interact with operational tools at the mobile operator such as firmware management to ensure healthy ops
- Validate installation parameters and generate birth certificates
- Provide access to monitoring and telemetry data to external platforms via standard APIs
- Evolve into the monitoring and telemetry of the small cells in the network, to trigger maintenance or dynamic changes in the network
- Support the engineering function at migration and network design.

Small Cells and Virtual EPC

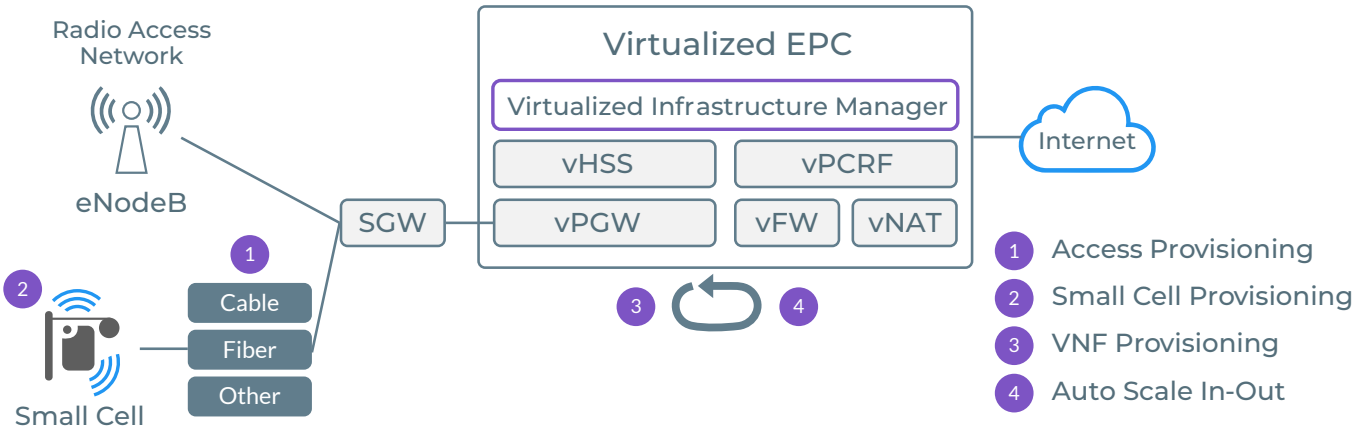
End-to-end provisioning and management – including a mobile app for field service tasks, devices remote provisioning and firmware management, fault & performance monitoring, dynamic scaling, and self-optimization.

Distributed network architectures are emerging to provide significant scale advantages and flexible deployment options. An example of this is the use of small cell distributed nodes to scale capacity and coverage of cellular networks.

This emerging type of distributed network architecture requires provisioning of the remote infrastructure to onboard new devices (or nodes) and manage them remotely across its lifecycle.



The solution provides orchestration across the various inventories, network, and element management system that are involved in the automation of provisioning. This also assures the quality of installation of new remote devices to the network infrastructure.



BENEFITS	SOLUTION HIGHLIGHTS
• Provides flexibility, expanded coverage, and improved QoS capabilities at an attractive cost. • Lower Capex and Opex by reducing reliance and specialized hardware, while speeding service delivery and allowing for on-demand scalability and responding to real-time network conditions and user needs. • Enables the pathway for 5G networks and dynamics services.	• Centralized cloud-ready codeless provisioning of small cells, access networks, and core virtual functions. • End-to-End automation of small cell installations and assurance via a mobile app for the field service technician. • Automatic provision and configuration of virtual infrastructure and network elements to provide infrastructure elasticity (dynamic scale in/out).

SYMPHONICA

Codeless provisioning automation for the entire lifecycle of services orchestrated across multiple networks and multiple technology domains.

For service providers looking to scale to provide lighting fast time-to-market and improve operational efficiency, Intraway's Symphonica is a no-code service provisioning solution.

With Symphonica, you can focus on growing your business without investing in a budget-heavy and time-consuming deployment project.

- Orchestration and activation of any service from any vendor across any network technology from a single point.
- Accelerate time-to-revenue by enabling zero-touch provisioning, orchestration, and service activation of every network element or system from a single platform.
- Create new or customize existing workflows and connectors faster. Unique in the market Design Studio. No coding required.
- Integrate virtually any network element, cloud, or on-premise in hours, regardless of the protocol.
- Assure the implementation with intelligent configuration checkups, inventory updates, and birth certificates.
- Transition from physical to virtual or distributed infrastructure.

Intraway
AMAZING DELIVERY

Intelligent Automation for the Autonomous Network

Supporting the service of over 40 million subscribers in more than 20 countries over three continents, Intraway's mission-critical solutions help global telecommunications operators create the network of the future, today. By unleashing the full potential of networks, Intraway's standards-based fulfillment and assurance solutions add the latest, cutting-edge functionalities to speed up time-to-market, reduce operational costs and advance customer-centricity.

Not only do we empower leading communications service providers with innovative, highly configurable, and ready-to-deploy solutions that enable seamless provisioning, orchestration, and first-rate service assurance, we do it while guaranteeing Amazing Delivery. This means that from our first handshake through deployment and beyond – we are a trusted partner for the complete service life cycle that is working side-by-side with leading operators towards their success.

Join us and secure your position as a key player in the global digital transformation.

www.intraway.com