

Solving the Challenge of Massive Small Cell Deployment for 5G

Tier-1 Service Provider Achieves Ten-Fold Improvement in Small Cell Turn-up and SLA Management Through Automated Solution

Introduction: The Impact of the Exponential Growth of Small Cells

Every day, operators make a promise to deliver high quality mobile service to their customers. 5G raises expectations of consumers—and the bar for service providers. 5G business cases call for dense wireless coverage for millions of connections and low latency. The only way to assure that millions of small cells and backhaul links will meet service level agreements (SLAs) at turn-up and during live operation afterwards is to perform continuous active testing of the links via an automated approach. Traditional manual testing methods are simply impractical for current and future needs.

This case study outlines the challenges faced by a tier-1 service provider in the US as they planned a major network expansion and details how they were able to automate the process of small cell turn-up and SLA management to deliver benefits in the speed of deployment and operational cost savings.

Small Cell Deployment Challenges

A large mobile network operator in the US was planning a major network expansion that included the deployment of 25,000 small cells in the span of one year, with a longer-term goal to deploy nearly 100,000 small cells. However, with current manual testing and

assurance process designed for macro cells, they were limited to deploying 10 small cells per day. To meet their goal, they needed to scale to at least 100 per day. Hiring additional staff or contractors was not an option.

A complex scenario

The project entailed complexities familiar to large mobile operators: they needed to provision IP backhaul for each site and support four different network equipment vendors as well as multiple access vendors or off-net providers with various topologies. This created significant challenges for standardizing turn-up, provisioning, and monitoring workflows.

The process of small cell turn-up can be divided into three main steps:

1. Service installation and turn-up
2. Trouble management for sites that are non-functional or under-performing at turn-up
3. SLA monitoring of active backhaul services

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

SERVICE INSTALLATION	TROUBLE MANAGEMENT	SLA MONITORING
<p> Failure to install on time (Turn-up/ Activation Issues)</p> <p> High percentage of turned up broken (Dead on arrival)</p> <p> Is the service delivered; what was ordered? (Customer dissatisfaction)</p>	<p> Large level of effort to isolate troubles (Large mean time to repair)</p> <p> Multiple dispatches to find then fix (Many truck rolls)</p> <p> Sectionalizing between service providers (Finger pointing)</p>	<p> No visibility into service performance (Reactive approach to problems)</p> <p> SLAs not met (Customer credits)</p>

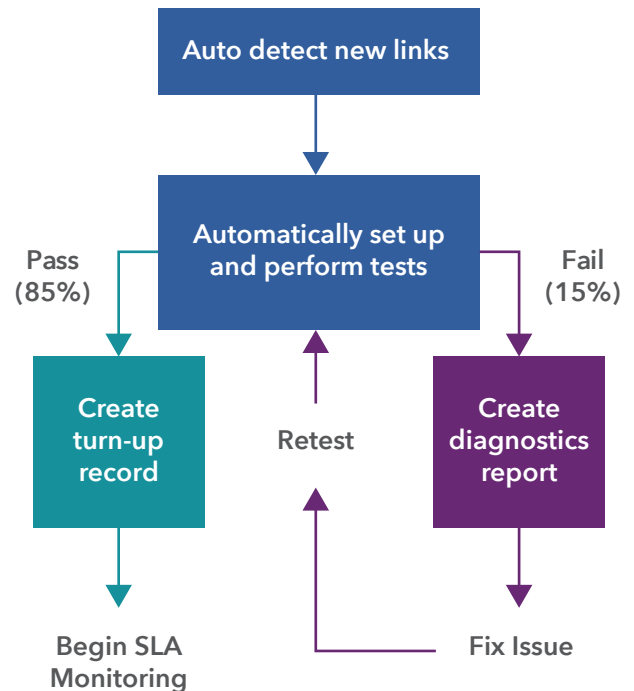
Small Cell Deployment Challenges

Solution: Automation of Turn-up and SLA Monitoring

The service provider turned to Spirent for a solution. Spirent is a leader in testing, assurance, analytics, and security to assure the capabilities and performance of networks, network equipment, devices, and services. After consulting with the service provider to understand the client’s ambitious goal, Spirent provided an alternative solution to outmoded ad hoc, reactive fault resolution, and painstaking manual testing.

Spirent’s VisionWorks solves a broad range of the challenges presented by the SP’s massive small cell deployment. Based on the Lifecycle Service Assurance concept, it automates the small cell turn-up and monitoring process with active testing to measure the real subscriber experience. It offers clear visibility into the network through active intelligence: analytics that automatically benchmark service quality levels and alert the operator to any deviations from established benchmarks.

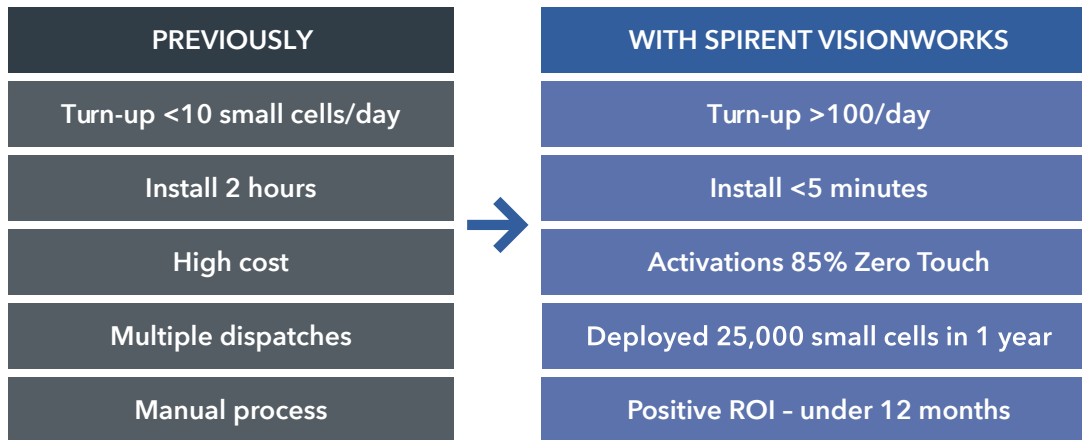
Where previously a technician had to dig through new services and manually configure the equipment and tests, Spirent enabled the operator to schedule and automate the turn-up testing process, so that most small cells could be activated automatically.



Small Cell Deployment Automation Workflow

More Activations. Fewer Dispatches. Faster ROI.

Savings to the SP: an estimated \$3M.



Results Achieved by the Tier-1 Service Provider After Implementing Spirent's VisionWorks

Conclusion: Automation Leads to Rapid Time-to-Market, ROI, and Cost Savings

Deployment costs are a critical piece, reports SDX Central. "There are challenges for us but it's not the network. It's the cost efficiency," an industry leader told financial analysts at the Cowen and Company Technology, Media & Telecom Conference. It will take a lot of fiber or small cells to backhaul the traffic from the mmWave antenna to the cell site. And fiber and small cells are expensive to deploy.

Addressing this challenge, the automated approach to small cell activation outlined in this case study enabled the service provider to reduce their deployment costs, activate new services faster, and improve the customer's experience.

Solving the Challenge of Massive Small Cell Deployment for 5G

Tier-1 Service Provider Achieves Ten-Fold Improvement in Small Cell Turn-up...

About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

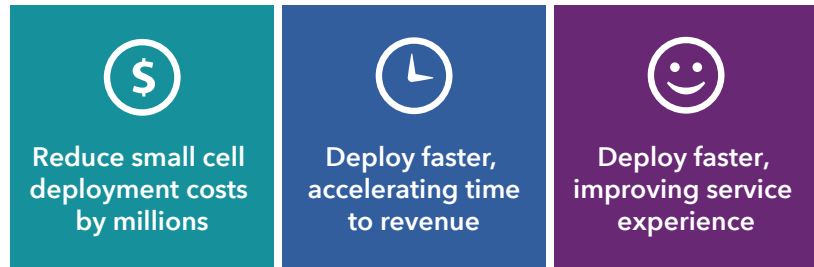
For more information, visit: www.spirent.com

AMERICAS 1-800-SPIRENT
+1-800-774-7368
sales@spirent.com

US Government & Defense
info@spirentfederal.com
spirentfederal.com

EUROPE AND THE MIDDLE EAST
+44 (0) 1293 767979
emeainfo@spirent.com

ASIA AND THE PACIFIC
+86-10-8518-2539
salesasia@spirent.com



Key Benefits of Automating Small Cell Acceptance

Lessons learned

Small cells play a key role in 5G use cases, which depend on dense wireless coverage for millions of connections and low latency requirements. Mobile Network Operators offer enterprise small cell services to attract high-value corporate and vertical customers. Small cells also provide service to areas where congestion on a single tower or a single macro cell has reached a point where the service quality needs improvement.

Enabled by automation, rapid small cell deployments lead to a significantly improved service experience for customers in uncovered or congested areas, leading to increased customer satisfaction and provider loyalty.

Providers planning to deploy large numbers of small cells should consider adopting the automation best practices presented in this case study. Given the significant advantages offered, rapid and extensive adoption of automation in testing and assuring small cell deployments can be a key competitive enabler in coming years for operators.