Spirent Layer 1 Automation
Automating Optical Connectivity in Development, Test & Support Labs
Efficiency, Flexibility & Reliability for the physical layer of your labs

Benefits
- Improved flexibility
- Open architecture
- Multi-tenant team support
- Agile and DevOps Ready
- Speed of light latency, error free signal transmission
- Speed and protocol agnostic interconnects
- Reduced equipment costs
- Management & utilization tracking
- Remote access to lab
- Heterogeneous test bed configuration
- Accelerated lab consolidations
- Improved product quality
- Reduced travel expenses
- Lower total cost of ownership over a longer switch lifespan

Spirent Velocity Layer 1 Solution is an efficient, flexible and reliable way to automate the physical layer of your lab removing organizational silos and bottlenecks that exist between facilities personnel and lab operators. Velocity lab management and physical layer orchestration framework manages the interconnections and determines the optimal path between the various devices in the test bed. At the physical layer of the solution is the Calient Optical Circuit Switch (OCS), the highest density, protocol and speed agnostic, all optical switch in the industry. It provides, near instant reconfiguration of the physical interconnects required for dynamic test bed configuration. Velocity also provides asset management, reservation capabilities, utilization reporting, and user management for an efficient, highly automated lab.

Challenges for Lab Operators
Equipment manufacturing and R&D test labs are under pressure to reduce their true cost of test while meeting accelerated test schedules. For test lab managers, this means deploying equipment in a way that minimizes capital spending while maximizing the efficiency of man-hours spent in the lab.

The challenge with existing test labs are that these facilities are very expensive to build and equip with a wide variety of high-value test and networking equipment and often the resources are seriously underutilized due to the large scale and lengthy reconfigurations that are required for every job or test. With traditional manual reconfiguration methods, these reconfigurations can take days or weeks to complete, during which the lab and all its resources are completely unusable by any other functional group or for any task. Unproductive time is expensive and the cost escalates when human labor is factored into the wait/work time to make changes to lab configurations and setups, often with mistakes that take time to troubleshoot and resolve.
Trends in Lab Environments

- **Lab consolidation and resource optimization**: Companies are economizing through consolidations of assets, creating large, dense, and diverse labs. The labs are becoming multi-purpose, with a mixture of users now accessing the same equipment for different purposes.

- **Networking speeds are increasing**: As new network speed standards become popular, labs have a need to support a wider array of technologies. It is no longer sufficient to support single-speed assets. 1G, 10G, 40G are now mainstream in the datacenter and network. 100G is growing rapidly. New speeds such as 2.5G, 25G, 50G and 400G are just over the horizon. Lab infrastructure needs to be flexible enough to quickly embrace these new technologies. As the speeds increase, interface costs grow.

- **Continuous testing practices**: Optical manufacturers, NEMs, service providers, and enterprises are embracing AGILE and DevOps which requires continuous, rapid testing of a variety of products and services.

- **Lab automation is more than just IP interconnections**: A variety of interfaces need to be automated such as Fiberchannel, InfiniBand, PCIe, and CPRI. Beyond fiber, other physical mediums need support such as RF.

---

Spirent Layer 1 Automation Solution

The Velocity Layer 1 solution combines intuitive management software with reliable and field-proven hardware to create a dynamic optical layer in test environments. This drastically reduces the lab provisioning time from days or weeks to minutes each and every time a change is required, resulting in increased resource utilization rates, reduction in costly wait time, and much faster testing and release to customers for new product features and fixes.

With a minimal amount of training, any technician can use the system to reconfigure the test bed in seconds without needing to spend time and resources cleaning and inspecting the new optical connections. Furthermore, the OCS enables technicians with administrative access to assign user levels by port, thus preventing usage conflicts that can arise if independent test groups try to access each other’s resources. The system also supports virtual assets and heterogeneous test beds comprised of physical and virtual elements.

---

As illustrated above, networking hardware is interconnected via the OCS, allowing topology, configuration, and test equipment changes to be made dynamically under software control without manual intervention.

Reconfiguration is handled seamlessly and reliably each time without human intervention or errors. Users visualize the required test topology in Spirent Velocity and network settings can be easily saved and recalled on demand for the next series of tests.

Calient’s S-Series OCS technology delivers this capability in an extremely reliable, field proven, low energy and cost-effective package.
Summary of Benefits

High-value benefits of Spirent Velocity in development and manufacturing test labs include:

- **Open Architecture**: Fully integration ready. Velocity has a full REST API to support all the same activities available through the graphical interface. It also has custom driver capabilities that allow Velocity to command and control over 40 different types of device or software application interfaces.

- **Heterogeneous test bed configuration**: Physical, virtual, hybrid, RF, FC, and Ethernet mixed-media test environments. Automatically configured according to the requirements of the test case.

- **Multi-tenant team support**: Consolidated labs that allow teams to work autonomously and in privacy while still maximizing resource utilization across the lab.

- **Management & utilization**: Tracking of all the equipment in the lab, as well as utilization of the lab by the users.

- **Integration with Agile and DevOps**: Rapid development processes

- **Remote access to lab reconfiguration capabilities**: No longer tracking down lab technicians for reconfiguration assistance.

- **Less Equipment is Needed**: High-value test equipment (OTN tester, OSA, etc.) can be shared across multiple test setups instead of investing in dedicated resources. Similarly, the same “Device Under Test” can be used for multiple test scenarios and configurations.

- **Multiple Labs can be Consolidated**: Large product vendors and end users typically have multiple lab environments each with its own networking and test equipment, real estate, power, and staffing costs. Examples include Product Development, Software Validation, Customer Support, and Presales Demos.

- **Improved Product Quality**: Automation facilitates consolidation by allowing test facilities to be used 24/7 to be operated and configured remotely by different company stakeholders.

- **Reduced Staffing and Travel Expenses**: Automated reconfiguration means new test setups can be provisioned at the touch of a button rather than manually. This reduces lab-staffing needs and allows remote users to configure and run tests. There is virtually no need for users to travel to visit the test facility.

- **Improved Customer Response**: Customer networks can be simulated in hours vs. weeks allowing very rapid response to problem and failure scenarios. There are also some tests that are extremely difficult to simulate without test automation. For example, in a service provider network, simultaneous fiber failure of 16 BLSR OC-192 rings would be almost impossible to simulate without fiber automation.

- **Improved Flexibility**: Multiple test shifts can be scheduled and tests and re-tests can be rescheduled to available off-peak periods to improve turn-around time. Lab technicians can work remotely if traveling or unable to be at the test facility due to weather conditions, illness, etc.

- **No Optical-Electrical-Optical conversion**: Speed of light latency, and error free connectivity between any devices, regardless of vendor.

- **Speed and protocol agnostic interconnects**: Introduction of new IP technologies to the lab with minimal infrastructure upgrade.

- **Lower total cost of ownership over a longer switch lifespan**: Fixed per-port costs despite increase in costs of higher speed interfaces.

- **Faster Time to Market**: Lab/Fiber automation without question reduces regression test and product release cycles, allowing new products to be brought to market much more quickly.