



The Mandate for Remote Lab Automation Management

Organizations both from the government sector as well as private enterprise are under intense pressure to rapidly test and deliver enhanced network services, validate new equipment and to quickly resolve customer issues. To do this they need to get more and more out of lab system test resources. In today's ever-changing business climate, automating critical lab and system test resources to increase utilization and reduce costs while allowing operators remote access is critical.

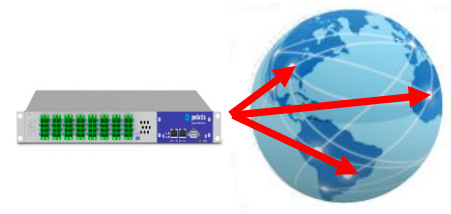
Remote Lab Management – Once a luxury, now a requirement:

Whether driven by the current Covid-19 pandemic dangers, or by the desire to leverage a geographically diverse workforce, many organizations, including the DoD are now requiring the ability to manage labs and complete testing cycles remotely. The ability to remotely control the testing and DevOps cycle is now considered essential in many organizations and has been driven largely by the following key factors:

- The need to manage Hybrid Network Environments – many organizations must leverage both on-premises and cloud-based resources
- Ensuring the health and security of the testing workforce as well as the lab environment by allowing complex network changes without lab personnel
- Maximizing the efficiency of a distributed, geographically diverse workforce to enable 24/7 testing schedules with automatic conflict resolution
- Driving efficiency to shorten development cycles and product development time while increasing equipment utilization



The remotely managed lab – once fantasy, now more realistic than ever...



World-wide remote control of automated lab environments is easy to implement...

Immediate benefits of Remote Lab Automation

Leveraging the power of a fiber layer all-optical switch in conjunction with an automated Software Defined Network (SDN) controller provides immediate benefits for remote lab management including:

Single Pane of Glass

Manage fiber optical connections and control **ALL** devices with a single interface

Self-Service Scheduling

On-demand equipment reservation and scheduling eases user frustration and maximizes production time

Maximize CAPEX Spending

15% savings on hardware utilization are typical with fiber layer optical switching

Automate & Orchestrate

Simplified configuration and provisioning of saved configurations allow for near instant re-configuration of topologies

One-Time Network Verification

95% Reduction in setup times and costs allows for dynamic, real-time network health checks and provisioning

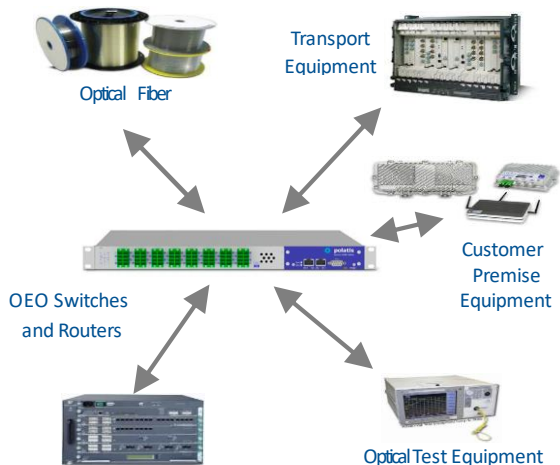
Multi-Tenant & Scalable

Consolidated labs, with a globally shared secure user and resource base

The Solution: Optical Fiber Layer Switching with Dynamic SDN Network Control

Network designers now have two powerful tools at their disposal when deploying an automated lab solution: Transparent All-Optical Switching (Polatis) at the physical layer and a sophisticated Lab as a Service solution (CloudShell from TSI).

Integrating the TSI CloudShell Lab as a Service (LaaS) platform with Polatis' family of fiber layer switching products provides an easy-to-use and extremely flexible solution for configuring fiber layer connectivity on-demand. The joint solution enables infrastructure vendors, data center operators and network service providers to quickly, and simply, execute complex equipment, system and service testing.



Polatis Fiber Layer All-Optical Switching

Polatis all-optical switching creates a transparent fiber layer interconnection platform, enabling dynamic and transparent interconnection of any device with an optical interface. Unique to Polatis are industry leading performance characteristics such as:

- Industry leading Insertion Loss and Repeatability
- Ultra-Low Signal Latency
- Optical Power Monitoring (OPM)
- Variable Optical Attenuation (VOA)
- Flexible Switch Matrix Sizing

Polatis is the optical test platform of choice for many US Government agencies, Military branches and the majority of today's transport and data system vendors.

TSI CloudShell Lab as a Service Solution (LaaS)

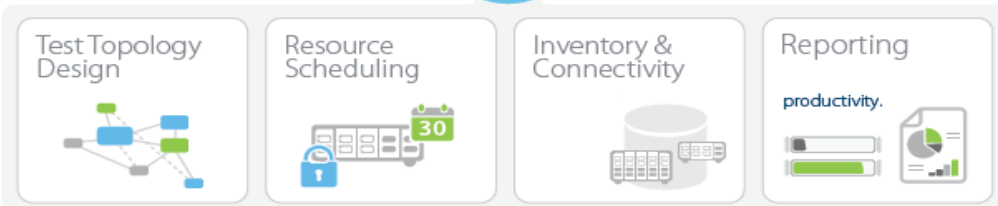
Simple, secure, self-service automation and orchestration for provisioning cloud-agnostic infrastructure environments in minutes, not months – for remote labs or on-prem. CloudShell slashes blueprint setup time by automating the management of IT resources. It offers clear visibility into your organization's resources as well as their availability status and it optimizes resource use.



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At reservation time, the route activation automatically configures the connectivity mapping in the corresponding L0/L1 fabric. CloudShell also provides the following:

- Inventory Management, with agnostic vendor appliance, VMs, and clouds
- Resource Scheduling and Provisioning, Domain and User Role Management
- Automation Framework built in with Environment Save and Restore
- Business Analytics, Reporting