Background

The Catalyst® 6500 Regression (6K) group in San Jose, CA has been facing new opportunities and growth in its regression test lab. The engineers needed a solution to support hundreds of ports with high volumes of topology testing while maintaining a practical budget.

APCON, Inc., based in Portland, OR specializes in layer-1 integrated hardware and software solutions for automated network connection management in test lab environments.

Benefits

Reduced capital equitment-costs by approximately $500,000 USD.

Electronic reconfiguration eliminated the possibility of manual errors and greatly improved test device utilization

Additional Applications for APCON INTELLAPATCH

Test automation and reconfiguration

Cable failure simulation

Sharing analyzer tools

Media conversion and amplification

# Cisco® Test Lab Trims $500,000 from Tool Budget

Reducing Equipment Costs using Physical Layer Switching

Efficient interoperability testing is an important factor in all purchasing decisions—swift system configuration lowers capital costs and yields faster time-to-market. Test lab departments need solutions to reduce hit-and-miss test trials during system reconfiguration. In addition, enterprise deployments require confidence that the manufacturer has proven the interoperability with its existing network infrastructure. Proven test results assure customers that their network configuration will work before they implement a solution. The APCON INTELLAPATCH® physical layer switch, also known as a layer-1 or matrix switch, is a low cost, easy-to-deploy platform for automating physical layer connectivity in test lab applications.

APCON Physical Layer Switches in action at a Cisco Lab

The 6K group operates an automated regression test lab for Catalyst® 6500 Series Switches. They faced the issue of dedicating Ixia® traffic generators between multiple devices under test (DUTs) in each of their 80+ testbeds. (fig. 1). In order to increase testing efficiency and scale, they incorporated APCON's INTELLAPATCH switches into their test topology.

Cisco Catalyst 6500 series

Cisco Catalyst 6500 series

Figure 1. Ixia generator dedicated to a single device within each of 80+ testbeds
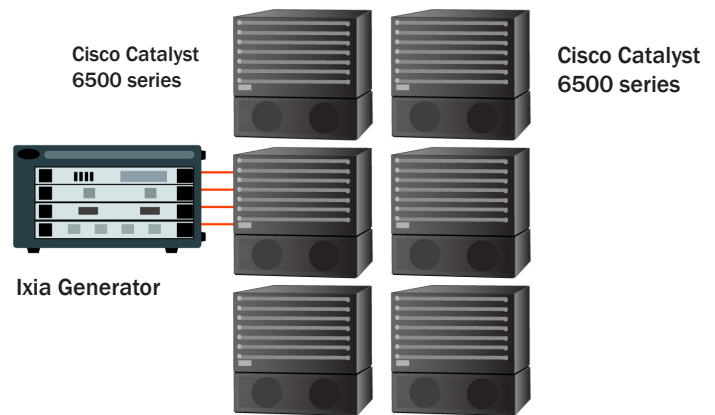
Ixia Generator

The 6K group designed a new "super test bed" concept with an APCON 288-port switch, creating a pool of testbeds that share one traffic generator. They connected multiple line cards on the units under test to each APCON switch, and then applied one Ixia generator per APCON switch to support several connected devices simultaneously. They have expanded to four test beds, each using an APCON 288-port INTELLAPATCH, to create a pool of super test beds that has increased testing capacity, reduced capital budgets and accelerated product to market. With this optimized design, they gained full coverage of all devices without the need to dedicate a traffic generator to each testbed. This increased equipment utilization by keeping valuable traffic generator ports active and working constantly (fig. 2).

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Cisco Catalyst 6500 series

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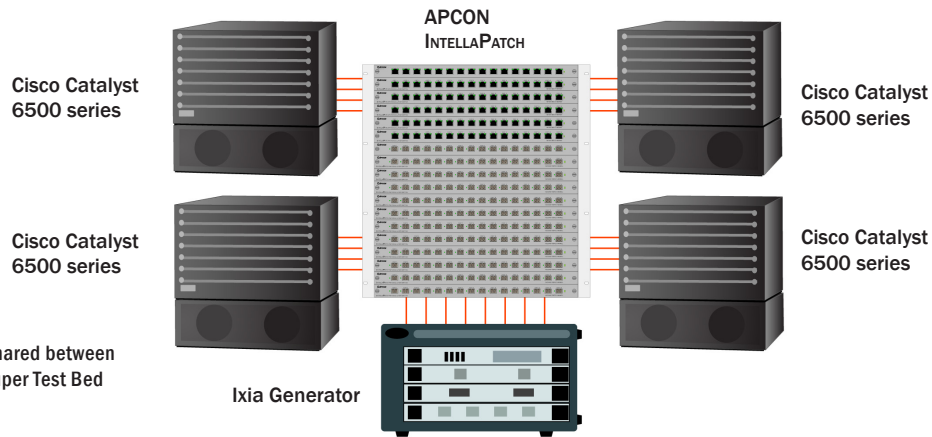
Cisco Catalyst 6500 series

Figure 2. Ixia generator shared between a pool of devices in the Super Test Bed

Ixia Generator

As part of the test process, the engineers created a Tcl script that automatically configures the APCON switch, creates a preset connection topology, and recalls each required preset topology for the next test. Not only can test setups be quickly created and reconfigured through scripting, but traffic generator signals can also be broadcast to any number of other ports with no signal degradation. Increased efficiency in equipment utilization means fewer traffic generators were required to test the same number of devices, which resulted in cost savings of approximately $500,000 USD.

Ashish Kapoor, an engineer with the 6K group remarked, "So far we've only explored a small feature set of these switches. We look forward to using them to their full potential and further streamlining our regression testing."

Logistical Challenges in Testing

The traditional test process involving complex topologies is troublesome to configure but simple to run. Physical connections are made between DUTs, then specific tests are run to confirm component performance and/or interoperability. New sets of physical connections are made for a different set of components, and another test is run. The process is repeated as connections, tests and reconfigurations are made. Thus, the test engineer logically runs tests between components in all possible configurations. Accuracy is critical—a configuration error or test error often requires the entire process to be repeated from beginning to end.

The Physical Layer Solution

Physical layer switches can provide protocol transparent, low-latency any-to-any switching for digital signals using both fiber and copper media. A layer-1 switch installed at the core of an automated test system allows users to rearrange network topologies and re-route signals instantly, while providing results that are more accurate based on repeatability. Adding a physical layer switch to a test lab can increase efficiency, decrease the time an engineer spends configuring and reconfiguring a testbed, and ultimately accelerate time to market.

Many test configurations use a dedicated one-to-one configuration between a testing tool(s) and a DUT. With the APCON INTELLAPATCH switch in place, engineers can wire all devices once and reconfigure many times over. Topology reconfiguration is simple using a graphical web browser interface that electronically connects ports on the INTELLAPATCH to switch tools and create new topologies. The INTELLAPATCH can also be automated using various scripting languages such as PERL and TCL.

For example, an engineer can connect a traffic generator and electronically move and share it between several different testbeds. The INTELLAPATCH can broadcast generator data from one port to many DUTs, all at full line rate. Similarly, an analyzer can be electronically tapped between two DUTS without interrupting or affecting traffic. Using this method, engineers can non-intrusively diagnose and debug issues across numerous testing points without needing dedicated devices for each DUT. A physical layer switching infrastructure eliminates the need for a large inventory of expensive test tools and provides significant cost savings.

APCON, Inc., based in Portland, Oregon, specializes in physical layer switches and integrated network management software that improves management of physical layer connections. Network connectivity products from APCON provide cost saving, easy-to-use solutions for test engineers, system administrators and IT managers. To learn more from an APCON representative, please call 503-682-4050. More product and application information are also available at www.apcon.com.