



Overview

Swisscom is Switzerland's largest telecommunications company, delivering all services and products for mobile, fixed and IP-based voice and data communications. Serving a country with one of the highest per capita broadband penetrations in the world, Swisscom supports expanding voice and data services through the Swisscom Optical Wavelength Network (OWNet).

Swisscom maintains several testing facilities to perform network integration testing. The labs verify new services and equipment against every possible network configuration before they are released into the network. Its Bern facility focuses on verification, education, test and trouble shooting while a smaller Zurich-based lab focuses on parameter testing. The labs are closely integrated, sharing equipment and test results.

It is a significant challenge to simulate and test new elements in a large and complex network. A complete test cycle against every possible combination of interfaces, protocols, bandwidth and equipment may involve over 6000 individual tests. The network is continually expanding and improving operations with new products and services. Each new network release must be comprehensively tested against this complex battery of tests under very strict delivery schedules.

The Challenge

The Swisscom optical networks test lab team, led by Maurizio Tomio, knew that they would have to do things differently to meet the aggressive testing schedules for the OWNet platform introduction and follow-on updates. Specifically they began to investigate ways to accelerate lab re-wiring. With a planned timetable of only three months to verify each new network release, the task was daunting.

Tomio began to consider the use of an all-optical switch for all fiber connection operations as a possible solution. Requirements for single mode fiber, very high port counts and the ability to connect any input fiber to any output fiber quickly shortened the list of possible products. As well, the testing team needed the ability to save and repeat test configurations with a very high degree of accuracy. Because the switch would essentially drive all testing operations, reliability and ease of use was also critical. "We wanted to spend our time testing, not moving fibres and cleaning connectors," said Tomio.

Swisscom chose to implement a Glimmerglass Intelligent Optical System. The system is installed at the core of the Bern lab where Tomio's team simulates networks. The lab consists of 20 workstations, 4 cross-connects and 120 network elements of different types, bandwidths and designs, including 7 levels of network generation. The system is installed in a matrix application in which it can connect anything to anything at any time. Tomio said that this application gives his team maximum flexibility -- they can instantly perform a test on a preset configuration in which the same set of network elements are set up in the same way, or interrupt and incorporate something slightly different with a point and click.

Create

Monitor

Reconfigure

Results to Date

“The Glimmerglass switch performs so reliably that we forget it is there,” said Tomio. “It is absolutely central to our testing operations. It has become transparent to us.”

Besides the speed and accuracy of the fiber connection itself, Tomio said that one of the biggest benefits of the Glimmerglass system was the savings in port cleaning costs. Previously, every changed connection had to be set up manually. Each connection then had to be cleaned and inspected by hand. The OWNet platform has 800 connections – 800 fibers and 6000 test cases to run. “Typically it would take us between three and five minutes to clean each connector. We could not have met our three-month test time frame using these manual processes,” said Tomio. “You can do the math, it just wasn’t possible.” The savings in port cleaning alone was enough justification for the purchase of a second system in 2006.

According to Tomio, flexibility is another important benefit of the Glimmerglass system. “Previously if we needed to run an unexpected test, we needed to plan the test, reserve time with the particular department and equipment, and ask them to stay off the equipment at a particular time. Now we can set up and run a test using just about anything in a half an hour. Today we set up and run additional tests whenever we have a bit of spare time. This has helped us incorporate trouble-shooting into our daily testing operations. We can simply put a test on pause, work on a particular problem and then resume the previous test operations when we’re ready.”

Advanced Features

Tomio’s team has made excellent use of some of the advanced capabilities of the Glimmerglass Intelligent Optical System. His team uses Photonic Multicasting to measure the quality of communications by “splitting out” the traffic signal and using the system to connect an optical copy of the signal to a spectrum analyzer. Because connections are made optically without regeneration, the spectrum analyzer can conduct a parametric test of signal levels from any of the transceivers in the lab’s network.

Swisscom also uses the Variable Optical Attenuation (VOA) feature integrated within the Glimmerglass system to test receiver sensitivity. Through this capability, Tomio’s team can both make connections and attenuate optical power to very specific levels for individual connections within a test. In this way, the team can remotely adjust the signal strength of communications and measure receiver sensitivity as a function of attenuation.

Conclusion

Tomio feels that because the system was incorporated during the early stages of the test lab set up for OWNet, he has avoided the need for additional equipment and personnel he would have otherwise required. As well, the system will help the lab move from current fiber bandwidth rates of 9.9 – 11.2 Gigabits to the expected 40 Gigabits next year, without significant change.

Swisscom’s investment in its test infrastructure has resulted in immediate, direct cost savings plus equally significant improvements in testing productivity. The Glimmerglass Intelligent Optical System has also allowed Swisscom to “future-proof” its testing lab, enabling lab staff to scale performance and add/change test equipment on demand to support Switzerland’s growing broadband requirements.

About Swisscom

Swisscom is Switzerland’s leading telecoms provider, with 5.9 million mobile customers and around 1.6 million broadband connections.

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