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BY LIGHT SYNERGY

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DISA LAB AUTOMATION

AVOIDING THE PITFALLS OF PHISHING SCAMS

NEW KIDS ON THE BLOCK

AND THE AWARD GOES TO....

RAYDON

AUTOMATION IN A NETWORKING ENVIRONMENT

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"Good Evening Alexa. Please turn on the fireplace, dim the lights, put on some smooth jazz, and pour me a cold one!" ….

Doesn't sound so futuristic anymore does it? (*Well, maybe the part about a cold one.*) We are all quickly becoming familiar, if not used to, the kind of automation computers can provide us in everyday life. The funny thing is that while we are automating all sorts of things at home, rarely are we using it at work. This especially is true in the world of networking.

These days buzz words such as "DevOps," "SecOps," and even "DevSecOps" are very popular. A key aspect to all of those is automation. This article looks at a Lab Automation project that By Light is currently working at DISA.

A LITTLE BACKGROUND PLEASE

A key differentiator to By Light winning the follow-on support contract on DISA's Global Information Grid Services Management – Engineering, Transition and Implementation Task Order for Advanced IP/Transport support (GSM-ETI – TO32) was our inclusion of Lab Automation for network equipment and topology testing. We proposed using automation to speed up testing across the different facets that make up DISA's network lab – optical transport equipment, IP routers and other pieces that fit into the network such as cryptographic equipment.

The DISA organization that By Light supports is responsible for the architecture and testing of new features for both NIPRNet and SIPRNet. All equipment upgrades must go through extensive testing to make sure it operates as expected in the DISA lab before being deployed to the operational network.

SO, WHAT'S THE PROBLEM?

When done manually, testing code upgrades for some of the major backbone routers can take as long as four months! When you consider that router manufacturers release an average of three to five major releases a year (along with many other minor releases) you can quickly see that manual testing quickly becomes a bottleneck. This not only has the effect of slowing down the deployment of new services and functionality but also threatens the deployment of essential security updates.

IT'S ALL ABOUT TESTING VELOCITY!

By Light teamed with Technical Systems Integrators (TSI) of Orlando (highly recommended) as subject matter experts (SMEs) for the test automation suite, called CloudShell, chosen by DISA for this project.

Why CloudShell? Well, lots of automation tools were compared and assessed, but Quali's CloudShell showed it could scale and support all of the devices in the lab. The CloudShell environment from TSI allows users to increase the velocity of testing by abstracting infrastructure away from the test and incorporating easy to use automation of testing.

READY, SET …

As a team we agreed it was best to automate a test plan that had already been created and used for testing. We choose the test plan for Cisco IOS XR - the one that took four months to perform manually. From a resource perspective we were looking to TSI to provide CloudShell test suite training to By Light onsite network SMEs and a couple of Government leads.

With new CloudShell knowledge, we would then partition the 150 individual test cases amongst our network engineers. The thought was that our network engineers would be the best to write the "scripts" since they were most familiar with the tests and the test environment.

From a technical perspective not only were we looking to automate test commands, but we were also looking for a new physical approach to the solution. You see, every time the lab needs to test a different scenario with different routers, cables must be physically run between the routers being used. Yes, we heard of patch panels (and use them) but that still does not alleviate re-cabling to get to the configuration needed.

Instead, we decided to use a programmable optical cross connect and home run (directly wire) all test routers to it. DISA choose Calient's S320 Switch (but there are other good options out there). With the optical cross connects we can now dynamically reconfigure the interconnection of the routers remotely.

NOT SO FAST

About four months into it, we made progress in setting up the servers and software environment but little to no progress was being made on actual test automation. Our network engineers were pulled into Tier III issues or diverted unto those "Gotta have it tomorrow" projects. Besides the constant reshuffling of priorities, we also encountered the fact that many of our current network engineers (many CCIE and JNCIE level) are not familiar with coding. It was not just how to do the test at hand, but how to write them in a re-usable manner so they could be used in other test scenarios. Time to retool our strategy.

…GO!

We decided to have TSI help us with the development of test script development. Although they were experts in how to use Quali and structure tests for scalability, they lacked the network knowledge and context of specific DISA tests. So, we paired each TSI SME with a network engineer who would help with test setups, work out any issues with running the test, and test interpretations (pass/fail).

RETURN ON INVESTMENT (ROI)

With automation, we are now able to trim that four-month timeframe to less than two weeks, which includes reporting and reviews!! Now DISA can stay on top of vendor releases for quicker bug correction, security fixes and feature deployment while maintaining testing consistency without sacrificing thoroughness of testing.

This kind of ROI is going to the key to selling automation in your next bid. There is a lot of work up front, but the long-term savings are well worth the investment. You may need to tweak automation scripts for later code revisions (i.e.: new functionality, new or depreciated commands), but the maintenance effort is minimal in comparison to the former manual lab testing effort.

LESSONS LEARNED

If you're contemplating adding Lab Automation to your next project, here are some things to consider, that are also common to good program management practices:

- COMMIT TO SUCCESS Managers prefer to walk before they run—resist the foot dragging! Lab Automation requires the right talent set, proper staffing levels and realistic schedules. Part time resources ain't gonna cut it!
- EMBRACE CHANGE For most businesses, automation is a big change to testing process. Recognize challenges and set expectations right up front and , especially with upper management.
- FOCUS ON DEVELOPMENT Hire trained staff fluent in software development to lead the effort, ideally with a background in what is being tested. You need someone who knows proper development environments (from establishing code repositories to providing coding standards), not necessarily deep knowledge on the equipment being tested.
- FOLLOW THE MONEY Focus on a key project with good ROI—automation doesn't pay off for everything.
- BUILD ON SUCCESS The project should also be implemented in phases so that each phase leads to the next, with success of each phase creating a baseline for implementation of the follow-on phase.
- INVEST IN TRAINING Education sessions, formal training, and consulting are suggested for a successful implementation of an enterprise automation framework such as CloudShell. Adequate funding for these necessary tasks will directly affect the success of the project.

Just by leveraging basic test automation, we reduced one set of tests that took an average of 3-4 hours to under 90 seconds. Once the test automation libraries are filled out, we'll see further improvement by using the same set of tests over different configurations and even different vendors. □

"Alexa, load up the latest release on the SIPRNet testbed, run through the standard router tests, archive the report and if there are no errors email it to the Colonel. Oh, and pour me a cold one..."

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