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CASE STUDY

10X Acceleration of Network Package Testing through Automation

Customer Overview

The customer is a global leader in computer networking products.

The Context

The customer had developed a Splunk extension called Telemetry Collector (TC) that reads telemetry data from the network switches and packages it in a format readable by the Splunk Universal Forwarder (SUF). The SUF forwards this to a central Splunk server where data is collected and viewed on a Splunk dashboard.

The Splunk extension requires an upgrade every time the switch OS or the SUF have new releases or enhancements, because it works in conjunction with the two. Since the switches run on 12-15 versions of the OS, new releases meant manual regression testing for all OS versions, that consumed about 10 person days!

Due to our expertise in software development and automation, the customer approached GS Lab | GAVS to develop an end-to-end test automation framework that would accelerate release and regression testing, and to contribute to enhancements and new releases of the Splunk extension.

Type of Service Provided

Product Engineering

Technologies Used

Network Operating System, Network Applications

Solution Summary

GS Lab | GAVS built an end-to-end test automation framework for the customer's Splunk extension that included a backend automation test suite, HTML and Allure test reports, with support for Jenkins and Docker mode. This enabled a 10X reduction in testing time in person days.

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Challenges

- Extension requires upgrade every time the switch OS or SUF have changes
- Manual regression testing required to be done for several OS versions
- Time consuming and complex regression testing

Solution Highlights

- Backend automation test suite with 120+ end-to-end automated test cases
- UI automation test suite for customer application with network switch specific visualizations
- Jenkins support for test automation with variables provided through the Jenkins interface
- Provision of HTML reports and support for Allure reports
- Integration of Allure reports within the Jenkins dashboard
- Docker mode support for SUF running in docker container
- Maintenance, defect fixes, enhancements, manual release testing, release documentation

Solution Impact

- 10X reduction in testing time in person days through automation, round-the-clock scheduling, parallel test runs
- Automated test cases that can be run with multiple knobs for combinations of switch OS, TC, SUF versions, with or without SSL, HTTPS or Socket protocol, etc.
- Improved accuracy due to drastic reduction in manual testing effort and fatigue
- Increased scalability through easy addition of new test cases

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Solution Details

GS Lab | GAVS started out by building the end-to-end test automation framework for the customer's Splunk extension. This involved understanding the extension's functionality, creating automation test plans, developing utilities, and automating 120+ test cases. The team evaluated various test automation frameworks like unittest, pytest, and Robot Framework, and zeroed in on pytest for the Splunk use case. The team also suggested using Allure for better visualization of results.

1. Backend Automation Test Suite

Investigated the python SDKs to be used with the network switches and with Splunk. Developed libraries to communicate with each side and wrote tests which check the following:

a. Data is received by the Splunk dashboard at correct intervals
b. Each enabled index type is received
c. Enabling/disabling an index on the switch reflects correctly on the Splunk server
d. Correctness of data - if a switch has 50 ports, the name and status of each port should also be received by the Splunk server at each interval; if it has 2 fan modules, then 2 events with correct fan module numbers should be received by the Splunk dashboard, are examples of checks done
e. Correctness of data - done by parsing outputs from both ends for various data such as interfaces, switch inventory and hardware information, custom script data, topology and neighbor information, and so on
f. Working of both configuration methods supported by the Splunk extension
g. SSL support
h. HTTPS and Socket mode support
i. Extension install/uninstall and reload of test cases

2. HTML and Allure Test Reports

The framework generates HTML reports and supports Allure reports that have charts, visualizations.

3. UI Automation Test Suite

The customer has an application which has visualizations and views specific to their network switches. The team created a UI automation test suite to test the various UI tabs available in the app and to check if they function as expected along with filtering and bar chart rendering.

4. Jenkins Support for Test automation

The team has setup a Jenkins server in the customer's VPN which is capable of running test automation suites with various parameters and options that can be provided through the Jenkins interface. Allure reports are provided on the Jenkins dashboard for ease of access by global teams.

5. Docker Mode Support for Splunk Extension

Since the SUF can also run inside a docker container, the team quickly created an easy-to- use script to load/ start/ stop these docker containers. This is being used by end customers who prefer to use Docker mode rather than the traditional mode to forward Splunk telemetry data.

6. Defect Fixes, Enhancements, Documentation

The team has slowly taken over the creation of release documentation and maintenance, defect fixes for the Splunk extension. So far multiple end customer and internal defects for the 2.0.1 release have been fixed - including docker mode and upgrade fixes.

7. Manual Release Testing

Prior to every release, the team is also responsible for performing manual testing of the extension on various switch OS versions (around 10-12 releases).

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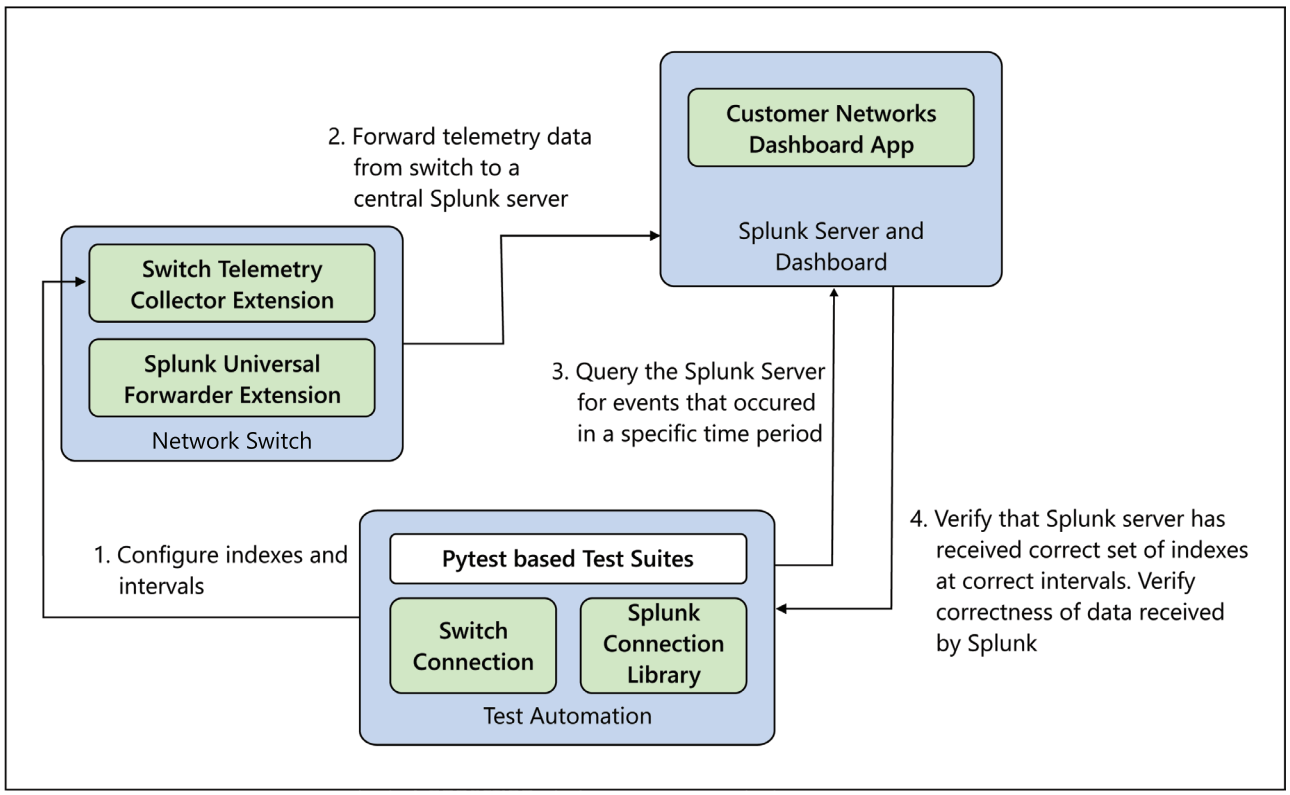
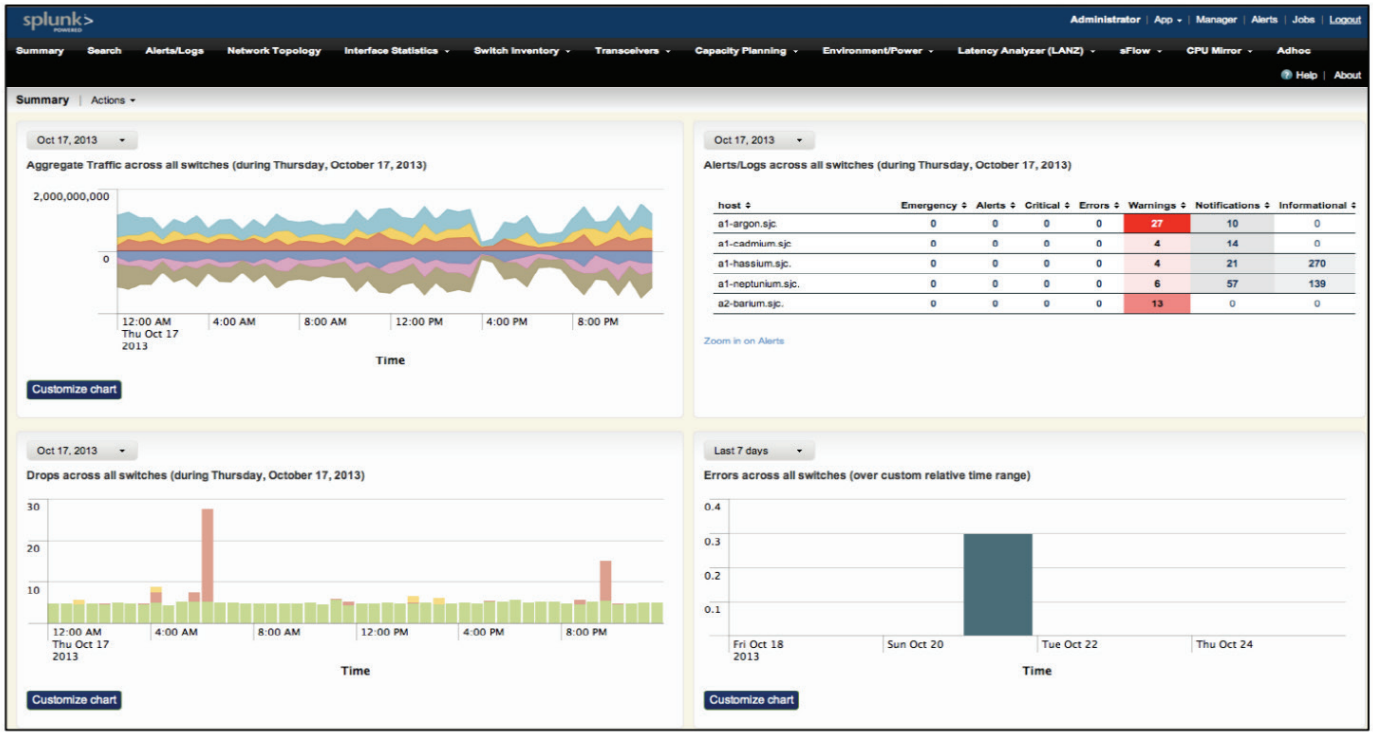
Automation Workflow Diagram



Solution at Work



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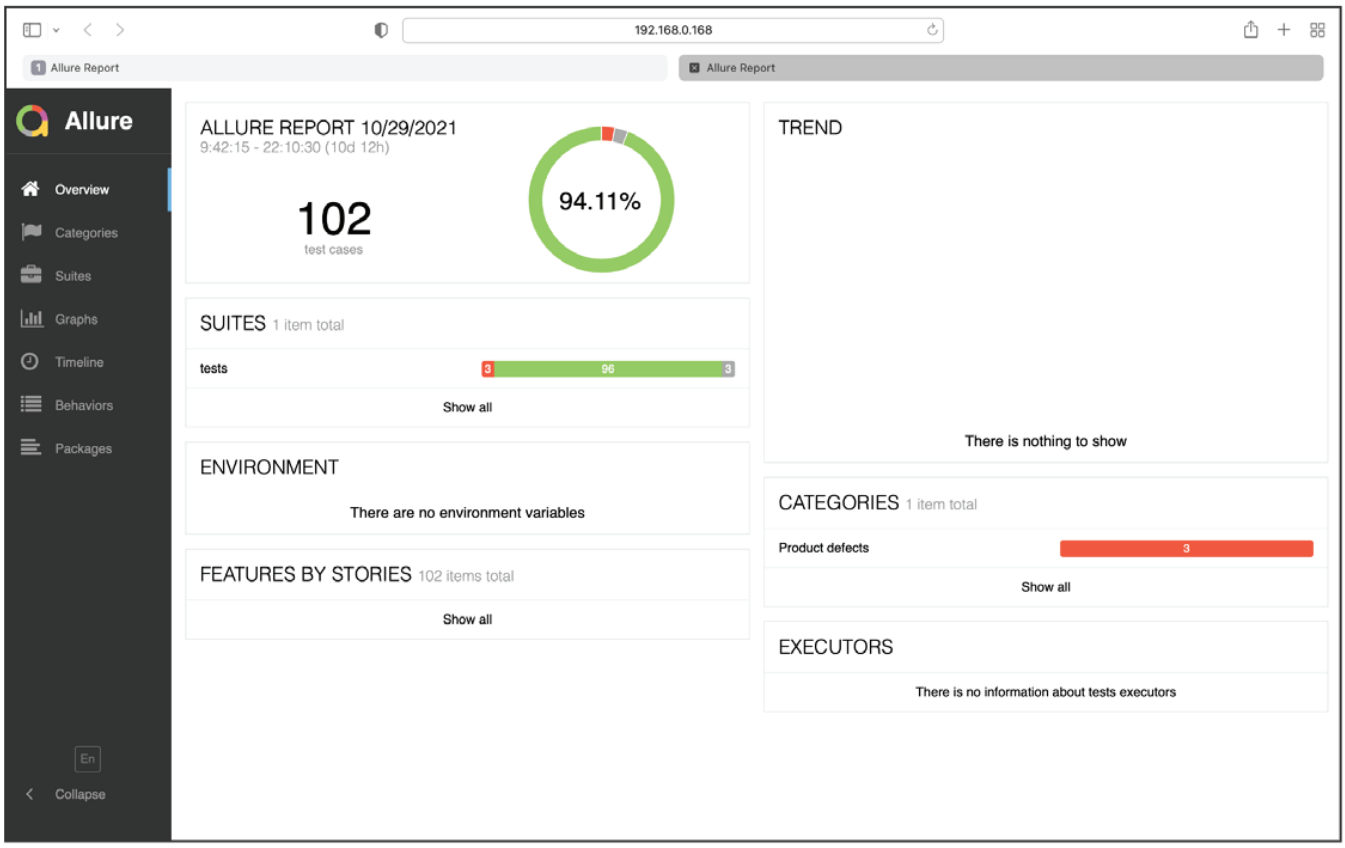

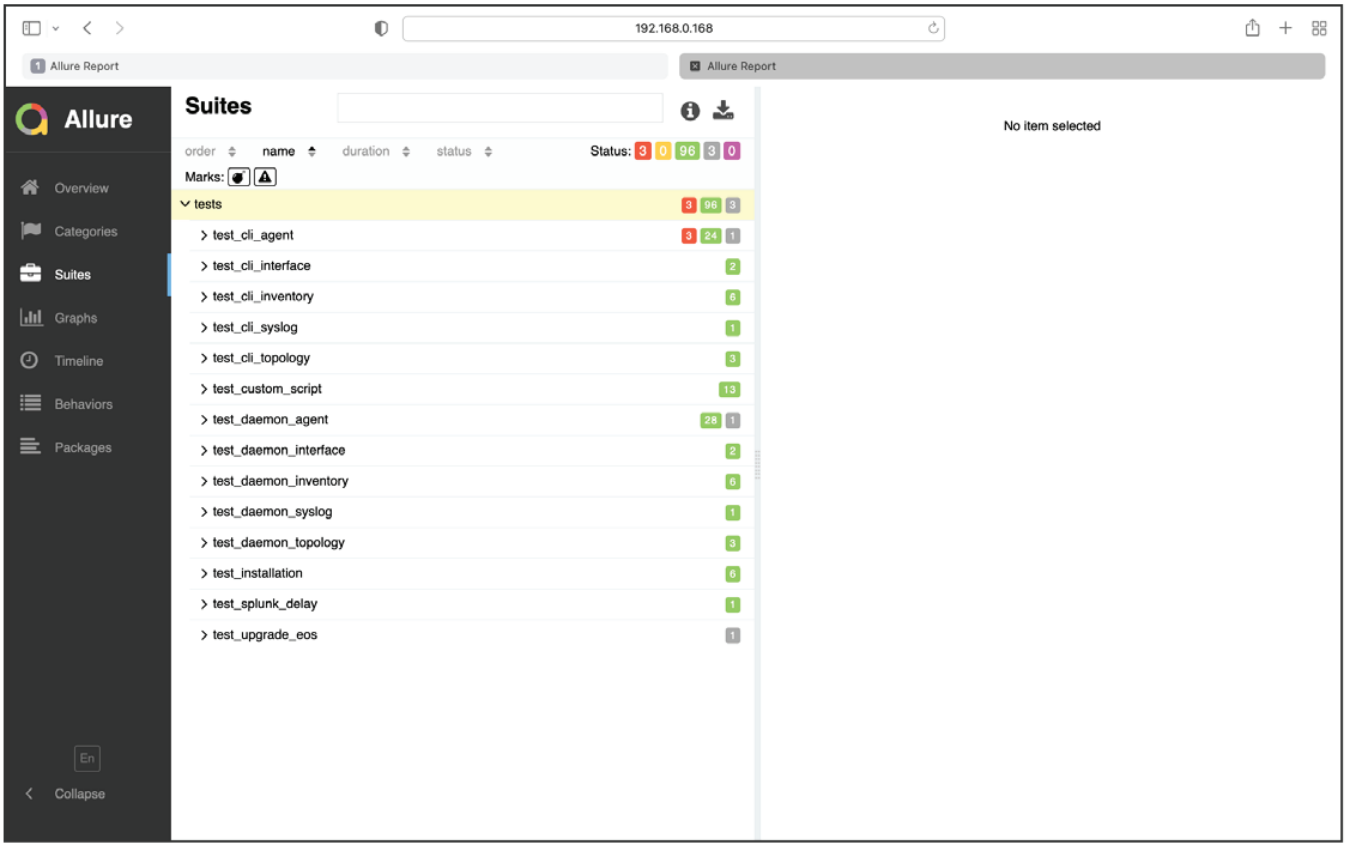

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