

Efficient Virtualization Continuous Integration (EVCI)

Customer Challenge Overview

With manufacturing sites in Europe and Asia, the customer was utilizing end-to-end testing strategy which proved impractical since a large part of the testers' time was spent fixing automated test cases related to unstable GUI test script code. The existing solution lacked stability and developers did not have a suitable framework to expand coverage.

With the existing test automation system:

- Errors were first analyzed by the QA team and then passed to the development team. This resulted in 40% of the development engineers 'chasing bugs' and thus creating costly delays.
- Build acceptance test coverage was minimal and build tests failed 50% of the time. Software versions were reverted due to unit and integration test failures.
- Results from the test automation solution group lacked actionable details.

The customer's goal was to improve automated unit test coverage to 65% for every subsystem and implement a strategy that defined clear ownership of test automation development, execution and results analysis. Additional requirements:

- Development of functional test automation with an isolated automated test capability
- Standardize the software merge and integration testing with a single team responsible for developing and maintaining it
- Develop and deliver an extensible, stable and reliable system with clearly visible performance goals and metrics that could be easily monitored to assure the performance goals were met

Customer Pain

- 40% of engineers' time was spent chasing bugs resulting in delayed releases and excessive costs
- Current test automation solution was inflexible, unintegrated and unstable
- Process holes across QA and engineering teams allowed bugs to escape to customers

Solution Delivery

Spirent Professional Services test automation experts and a Continuous Integration (CI) partner worked closely to develop a customized Efficient Virtualized Continuous Integration (EVCI) solution to meet the following requirements:

- CI framework enabling developers to build and test software code changes daily
- Robust, easy-to-use automation tool enabling QA automated testing via the most appropriate interface and enable developers to write sustainable automated functional tests that are reusable for regression testing
- Maximize virtualization capabilities to optimize the build and test resources while facilitating dynamic spinning up/down of build and test resources as needed to facilitate sharing
- Support off-the-shelf traffic generation tools and optical taps
- Ability to quickly isolate and correct software problems during the early development integration cycle
- Stable and scalable automation framework facilitating expanded test coverage

Solution Delivery

- Team of services experts developed solution for custom requirements of three global locations
- Robust, easy-to-use test automation tool deployed
- Stable solution across teams and maximized virtual assets across regions

Solution Delivery Components

- Implementation of hypervisor and cloud management
- Creation of build and test server VMs (Virtual Machines) and of DUT/SUT VMs
- Implementation of CI management server and test automation
- Implementation of an artifact storage server and software code revision control server
- Implementation of centralized test report database
- Develop initial automated test suites as well as extend existing automated tests
- Implement code coverage reporting
- Professional Services consultation and delivery expertise through engagement
- Training and transfer of information and best practices regarding CI and test automation

Following the first phase of the validated solution delivery in the United States, the EVCI solution was then implemented at the customer's European and Asia Pacific manufacturing facilities.

Solution Outcome & Benefits

- Complete CI framework which enabled their developers and QA teams to accelerate their build and tests of their software code changes more frequently and more reliably
- Maximized virtualization utilization for optimal build and test processes and facilitated dynamic efficient use of the entire VM server farm
- Accelerated fault isolation and helped correct code problems earlier during the integrated phase, resulting in fewer bugs
- Stable and flexible automation framework for reliable reporting processes, improved process reliability and visibility

Performance Metrics

Metric	Before EVCI	After EVCI
Major release frequency	~6 months	~3 months
Minor/errata release frequency	~1 month	~2 weeks
Average # of new features per year	110	150+
Average reported critical defects per major release	1260	10
Average complete system (main) builds per day	<1	10
Average complete system QA test cycles per day	<1	10
Average module builds per day	N/A	100
Average module QA test cycles per day	<1	100
Features tested using automation	<5%	85%

Contact Us

For more information, call your Spirent sales representative or visit us on the Web at:
http://www.spirent.com/About-Us/Contact_us.

AMERICAS 1-800-SPIRENT | +1-818-676-2683 | sales@spirent.com
 EUROPE AND THE MIDDLE EAST +44 (0) 1293 767979 | emeainfo@spirent.com
 ASIA AND THE PACIFIC +86-10-8518-2539 | salesasia@spirent.com

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