Boston Office:
1 Harris Street
Unit 7
Newburyport, MA 01950

Little Rock Office:
401 Main Street, Suite 203
North Little Rock, AR 72114

Quality issues impact velocity of Continuous Integration/Continuous Deployment Pipelines

Issue

As organizations advance in their DevOps programs to migrate towards full continuous integration and deployment, test automation is a must for ensuring productivity and product quality. However, it is not uncommon within organizations to have a high percentage of manual testing and a track record of failed automation attempts due to these underlying issues;

- Lacking a framework to ensure patterns and reuse for test automation
- Licensing costs for commercial testing tools
- Using tools or scripts that developers don't use (Heavy weight, proprietary, not extensible)
- Lacking proper budgets and time to develop integrations to test management and defect tracking tools

Additionally, the following broader issues may need to be addressed as part of the test automation framework implementation, as part of the DevOps initiatives.

- Lack continuous build and deployment of the environment and application under test
- Lack of a test data strategy
- Lack of a test management
- Lack of quality standards

Lacking a strategy and framework for implementing test automation within your DevOps program will lead to delays or failed CI and deployments which put your systems at risk, drive up costs or miss revenue opportunities.

Elyxor Solution

The good news is our team developed the Elyxor Test Automation Platform (ETAP) as an accelerator to improve quality, accelerate development and implementation of test automation for your projects. ETAP is comprised of test services and utilities the we have found to be reliable and in wide use. The framework itself is versioned and allows for custom adapters and features as required if they do not already exist.

Key features include:

- Supports test suites written in Java, Python, and .NET
- Supports popular test engines such as TestNG, Cucumber and PyTest
- Integration to test management and defect management tools – Services use API calls to determine tests to run and for publishing execution results
- Enables DevOps adoption by integrating with CI tools and versioning systems

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- Elyxor Vortex Integration – Elyxor Vorteks platform provides a central portal and data store for all pipeline metrics used as the information source to visualize the quality, velocity and status of code delivery; audit activity, and evaluate business rules for pipeline quality gates (See Vorteks Test Automation Dashboard).
- Pre-built libraries for test suite configuration and test data

As depicted in figure 1, ETAP is a component within a test automation system and functions as a bridge from application test suites to test suite data and configuration; testing tools; and test reporting such as Vortex.
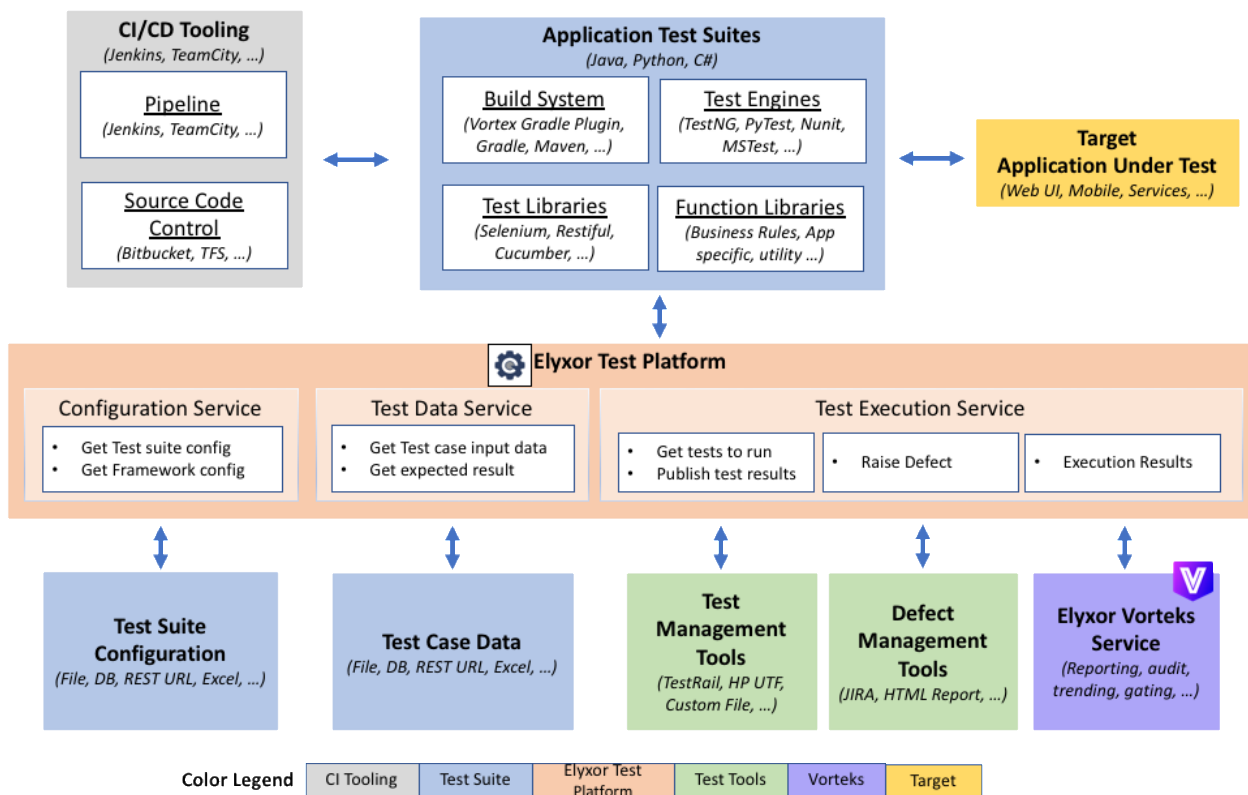

Figure 1 Test Automation Framework integration

ETAP is intended to be leveraged by multiple test suites, enabling re-use and standardization.

Figure 2 depicts an example of a layered deployment design where:
1. The Elyxor Core Framework is packaged within an "Enterprise" layer. This Enterprise layer, for example, could be configured to use the enterprise test management tool.
2. A business unit can then consume this enterprise artifact and extend it with common libraries. For example, the configuration for their defect management tool as to create a "Business Unit" layer.

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3. The "test suite" layer for a specific application is built. This test suite will leverage both the enterprise and business unit common configuration and shared libraries.

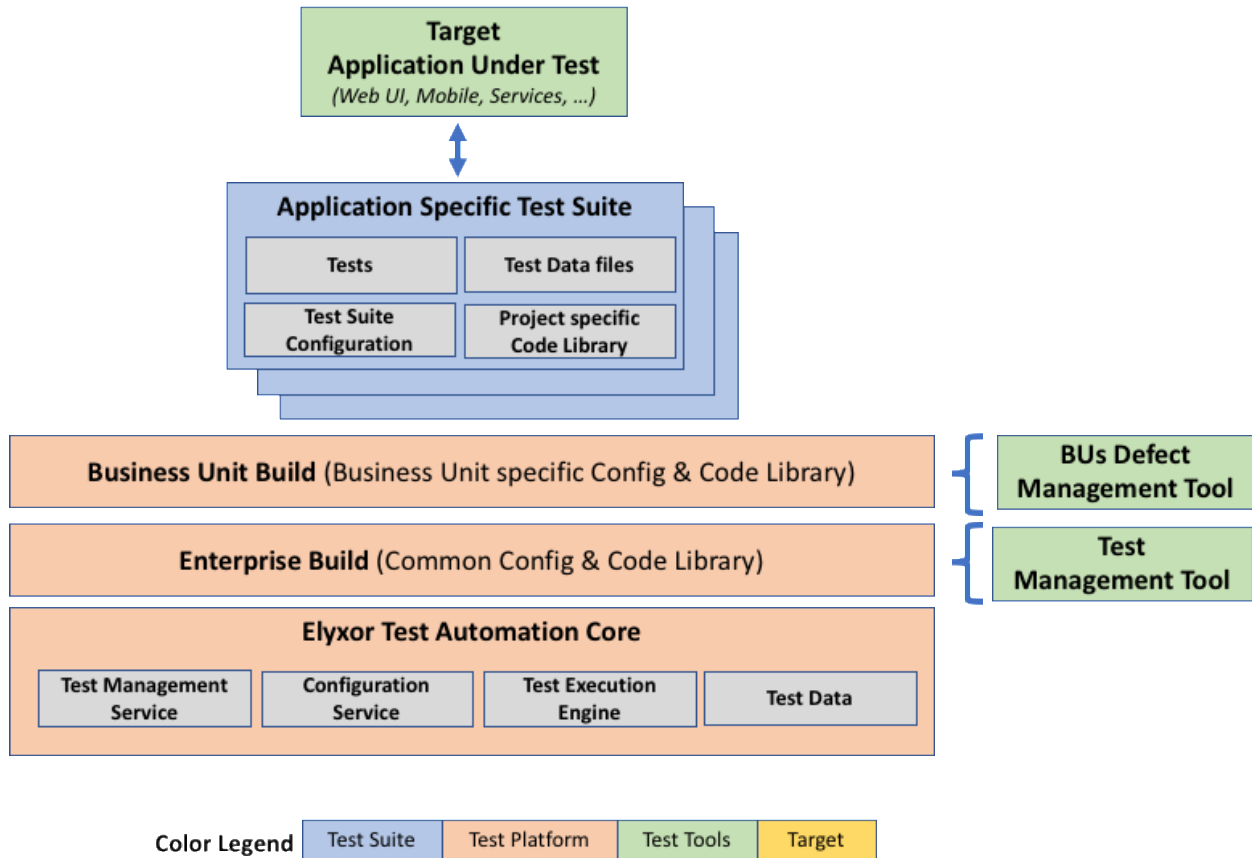4. Other tests suites can also be created that reuse these Business Unit" layer

Figure 2 : Example Test Automation Framework implementation pattern

Results

ETAP, when used in conjunction with Elyxor's implementation of Continuous Integration / Continuous Delivery, you will realize the following benefits;

- Reduced risk related to deployed artifacts and configurations
- Increased the stability of automated deployments.
- Faster time to delivery
- Eliminated manual activities
- Increased release velocity
- Increased speed to market
- Return on Investment

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Considerations

- Define a test data strategy that supports continuous test execution and can be executed via automation
- Establish continuous build and deployment of the environment and application under test. Aim for a nightly build and automated test execution
- Define process and quality standards and enforce with a test management tool
- Design the test execution to support orchestration across application components
- Define a plan to have tests integrated into continuous delivery and are treated as code
- Create requirements and an architecture that support testing, for example stubbed services

Vortex

Elyxor Test Automation Framework in combination with the Elyxor Vorteks Dashboard, will provide the visibility and controls to further improve the performance and extend productivity gains of any CI/CD implementation.

With Vorteks, as depicted in figure 3, you will realize the following benefits;

- Full Pipeline Visibility
- Code and Deployment Auditing
- Enforce quality policies
- Flexibility to support differing quality requirements
- Supports various technical implementations and data sources
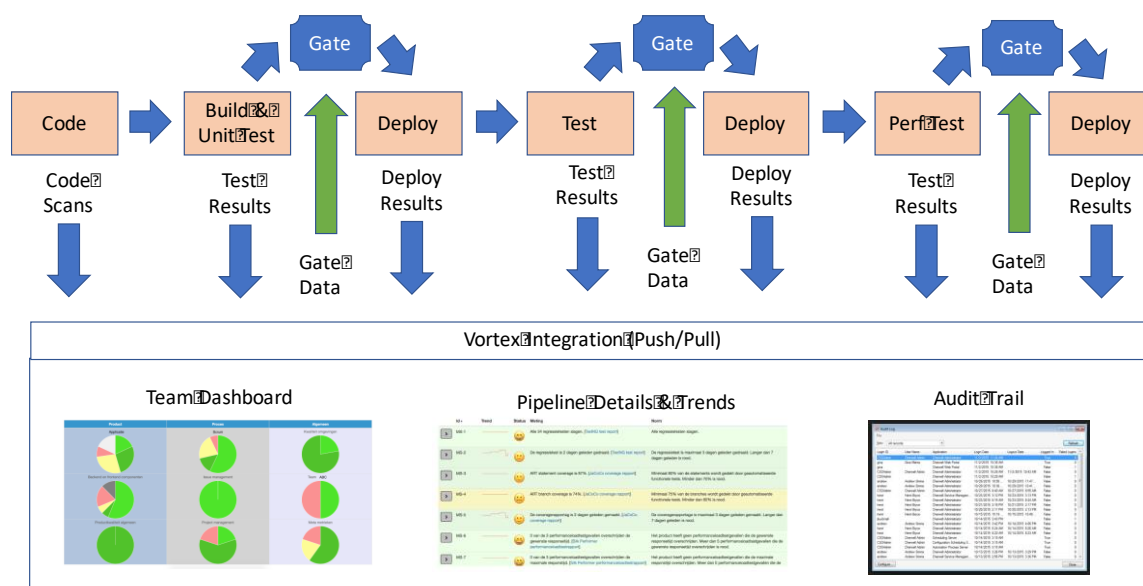- Scale from single project to Enterprise deployments

Figure 3 Elyxor Vortex within the pipeline