OpenTest Assessment and Enhancements

Internal Reviewers	Reviewed (Y/N)	Client reviewer
	N	

Objective

Define common test automation framework for different teams at McD to ensure consistent quality, increase ROI on automation, enforce best practices, document findings around test automation tools and processes across different product teams and establish common understanding for all the stakeholders.

Purpose/Target Audience

This document outlines the vision, reasons, and criteria for standardizing on a specific test automation framework. It also documents gaps, shortcomings, and room for improvement found during assessment process and describes approach to closing these gaps.

Technical notes on frameworks and test automation tools comparison also go into this document for future reference.

This document is intended for software quality personnel across development and quality teams.

Functional Test Automation Framework Requirements

Ideally, a single test automation framework can satisfy all of McDonald's needs in predictable future, for efficiency, consistent reporting and from the best practices standpoint (tools consolidation, Center of Excellence model etc). Leveraging the same framework will allow for reuse of testing assets between teams and markets, reduce maintenance costs, and make user training and onboarding much easier.

Technology innovation is moving at the extremely high speed and the framework should be built as a test execution harness with ability to integrate industry-standard solutions and emerging technologies with appropriate drivers. Locking into a specific tool or technology vendor is not a sustainable strategy in today's market and does not complement McDonald's IT strategy to employ distributed, loosely coupled applications architecture.

With several initiatives in progress (SE, DA) and business as usual work test automation framework should be able to leverage existing test assets and testers' knowledge and enable teams to quickly expand test automation coverage into areas where automation is not currently done because of resources or time constraints, ROI considerations, and other factors.

All of this translates into framework being able to support testing of mobile applications, web applications, custom POS applications, and micro services testing, being flexible enough to incorporate additional technologies without changing the core framework binaries and processes and without breaking existing testing assets.

Major Test Automation Framework Requirements:

- Support CI/CD
- Support DevOps
- Support in-sprint testing, SVT/Capability testing
- Support McDonald's technology stack
- Support micro-services architecture
- Support AWS/AWS Mobile Device Farm
- Minimize variety of tools
- Promote reusability
- Extendable, Scalable
- Requires sustainable support model (user support, enhancements)
- Must include people aspect (onboarding, training, documentation)

Overview of OpenTest

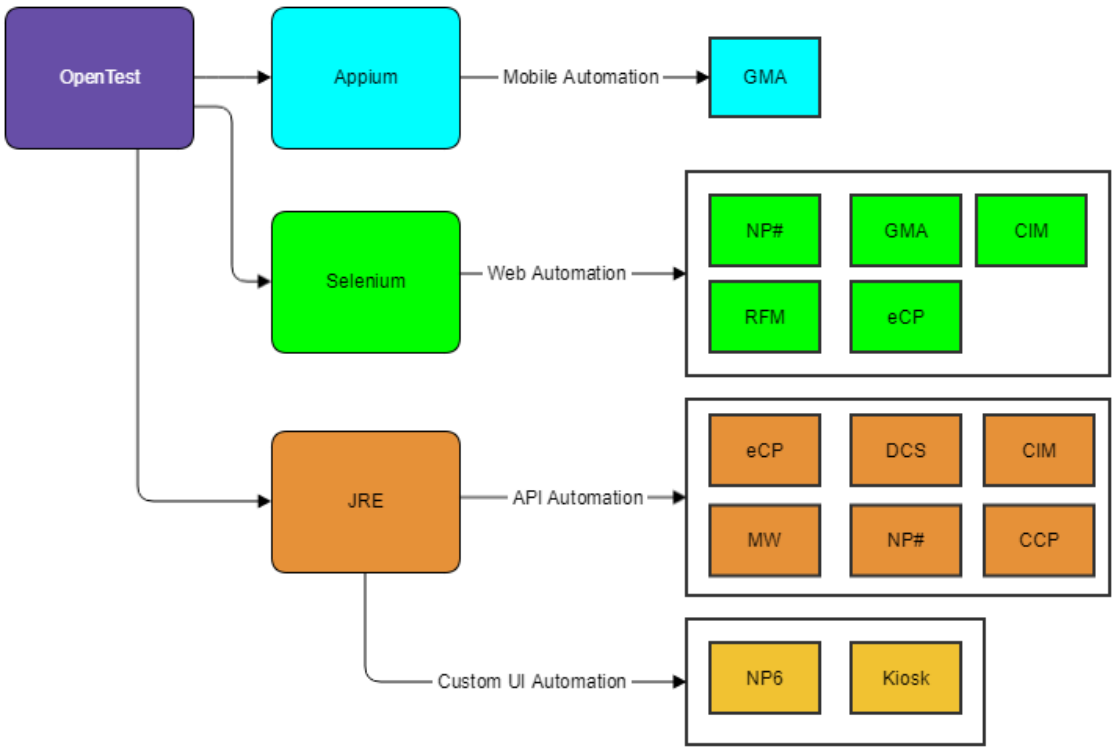
OpenTest utilizes industry-standard testing engines to automate functional testing, such as Appium for mobile testing automation and Selenium for WebUI.

The overall architecture of a tool is as follows:

- Sync Server is a Node.js based harness that reads automated tests and orchestrates their execution across registered Actors.

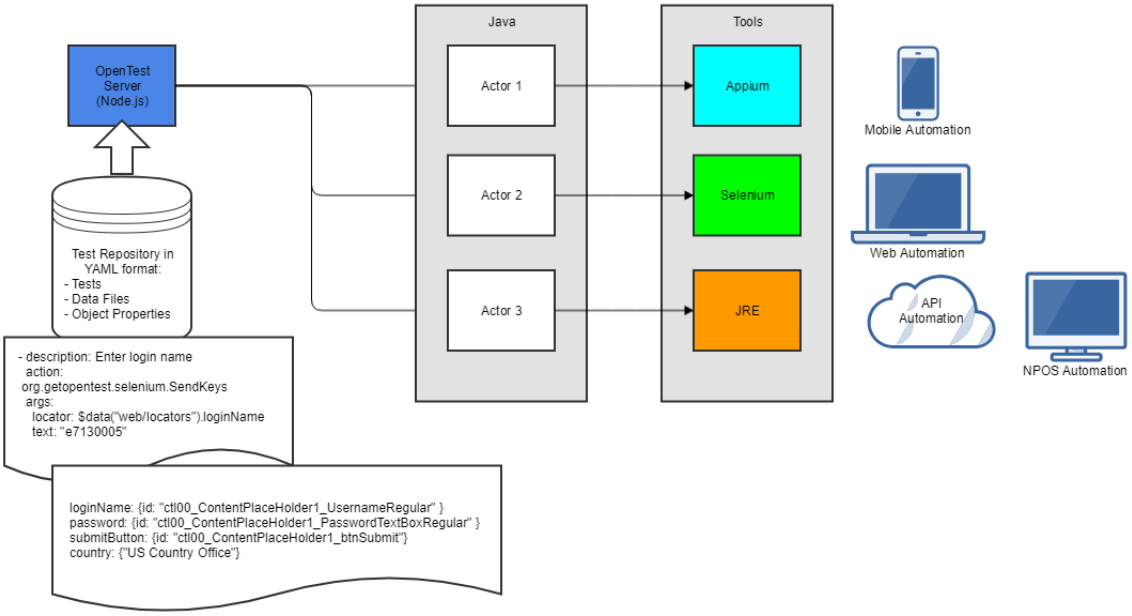
- Actor is a java application that responds to Sync Server instructions over HTTP and controls specific technology plugin locally (such as Appium or Selenium) to execute commands listed in the test.
- Automated Test is a YAML file that contains testing instructions, such as "Tap", "Swipe", or "AssertElement" with appropriate parameters.

OpenTest Framework and Supported Applications

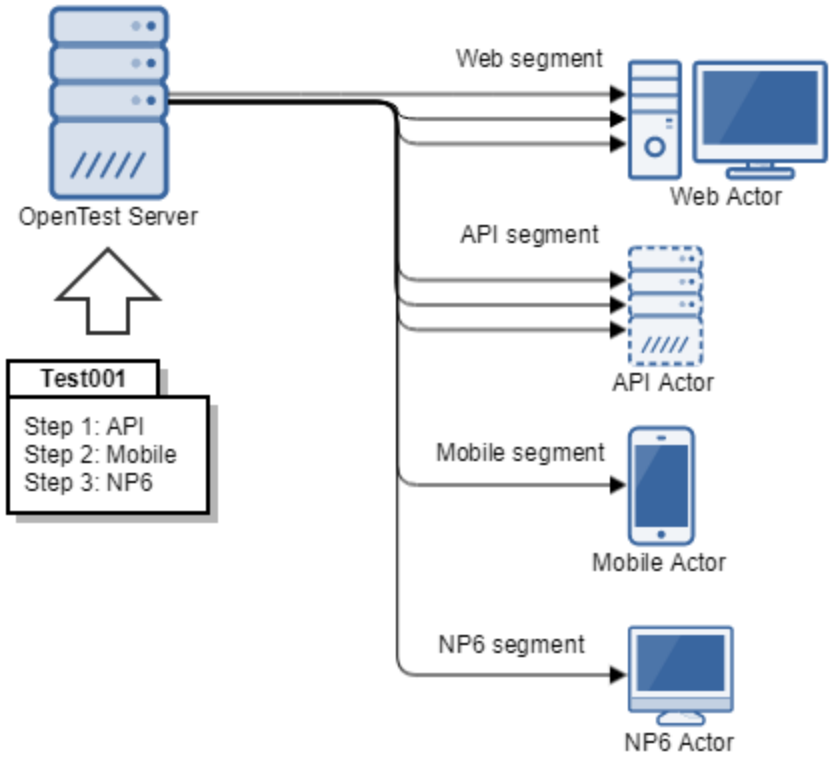


OpenTest Architecture

OpenTest Technology Stack

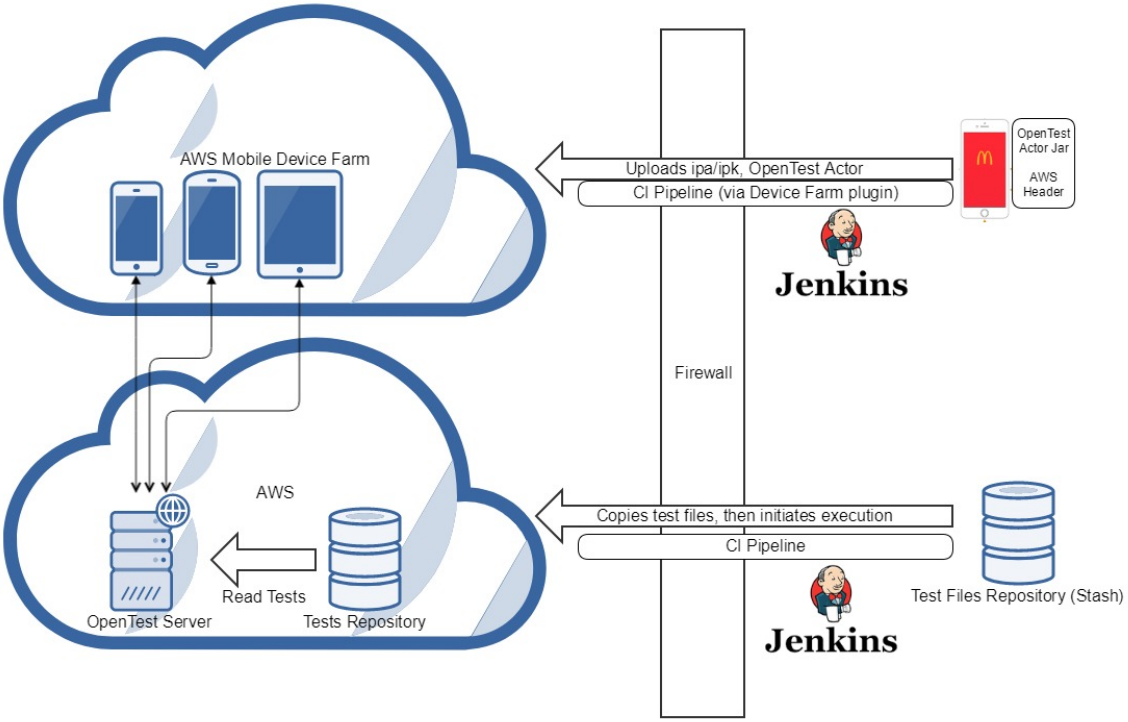


OpenTest Hardware Architecture

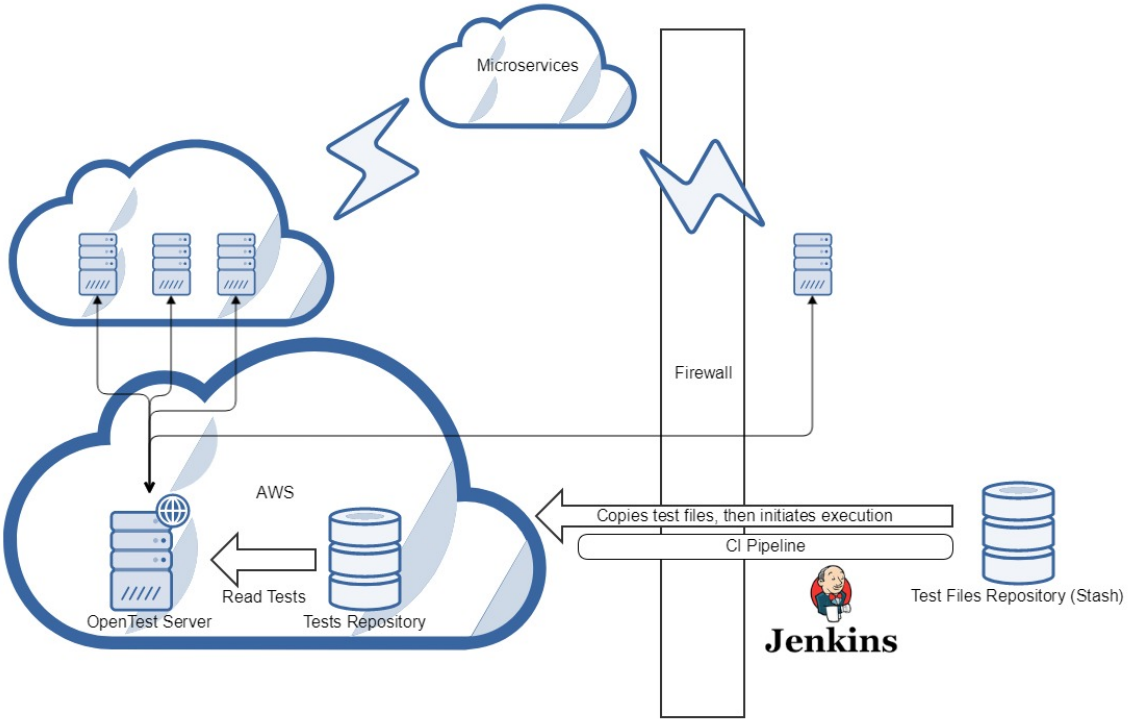


- OpenTest server orchestrates execution of tests across available actors according to their self-reported type.
- NP6 Actor is a [virtual] computer configured to run NP6 emulator. Only one copy of an actor can run on the same NP6 actor machine.
- Web Actor is a [virtual] computer configured to run browser tests. More than one copy of an actor can run on the same machine simultaneously.
- API Actor is a [virtual] computer configured to run API (micro-services) tests. Machine can be configured to run more than one copy of an actor at the same time.
- Mobile Actor is a cloud device or a physical device connected to a computer

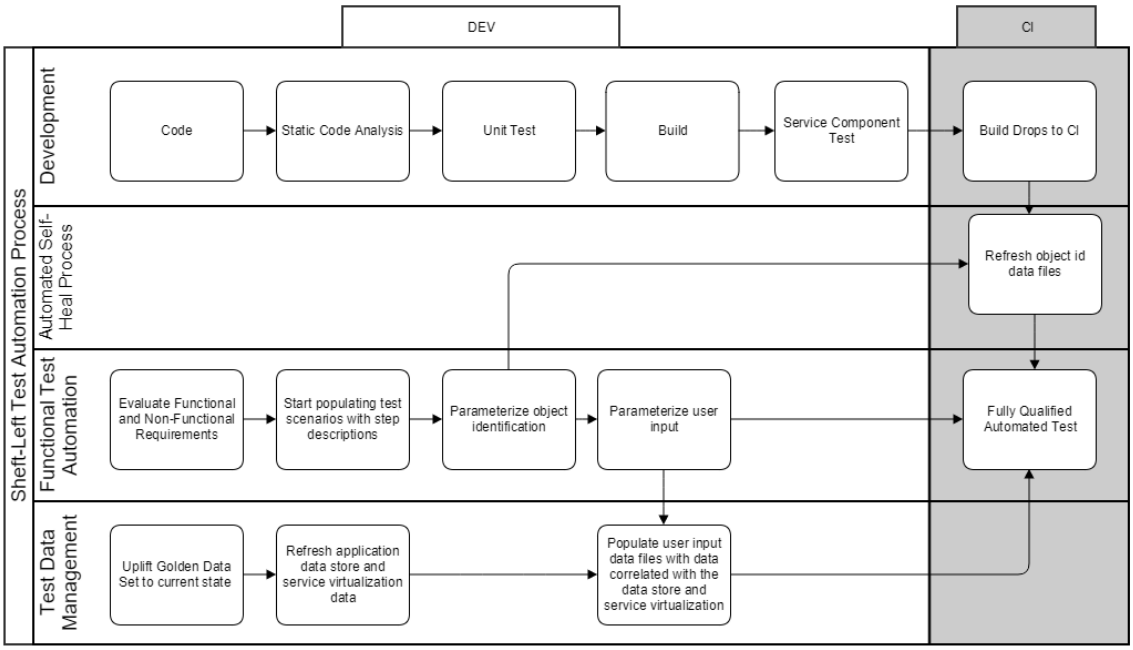
Running OpenTest on AWS Device Farm as part of the CI Pipeline:



Running OpenTest as part of the CI Pipeline:



In-Sprint Automation Approach with OpenTest



Technology stack support

Technology	OpenTest Library	Products	Comments
WebUI (Traditional, ReactJS)	Selenium	RFM, CIM, DEP	Selenium is the industry-standard WebUI test automation engine. Additional functionality has been added to Selenium keywords to improve support for ReactJS and other javascript-heavy web development frameworks. Selenium plugin includes the latest stable version of Selenium.
Mobile (iOS, Android)	Appium	GMA, SDK	Appium is the industry-standard Mobile test automation engine. Cloud device farm providers, such as Experitest and Perfecto extend standard Appium packages with their own methods. In case McDonald's starts using these platforms for its mobile testing Opentest may be extended with these additional methods. They need to be kept in a separate plugin and clearly documented as being proprietary, as switch of the vendor will render these keywords inoperable. Appium relies on the Selenium package which may be falling behind from the latest stable Selenium verison. Appium plugin will include its own Selenium package version within Appium plugin. Generally, it is recommended to upgrade to the latest stable version of Appium, at the same time given Appium history with making breaking changes decision of upgrading to the next version of Appium should be made after an internal review.

Web Services	Base (REST API)	MW, DCS, CIM Proxy, ECP,	Apache HttpClient library is used for making REST API calls.
NP6	NP6	NP6, NP#	Custom library + image recognition