Infusion Pump : Software Integration Test Automation

Project background

A class II Infusion pump PC Simulator SW is developed in C for a leading German manufacturer.
The hardware independent Source code is common across platforms.
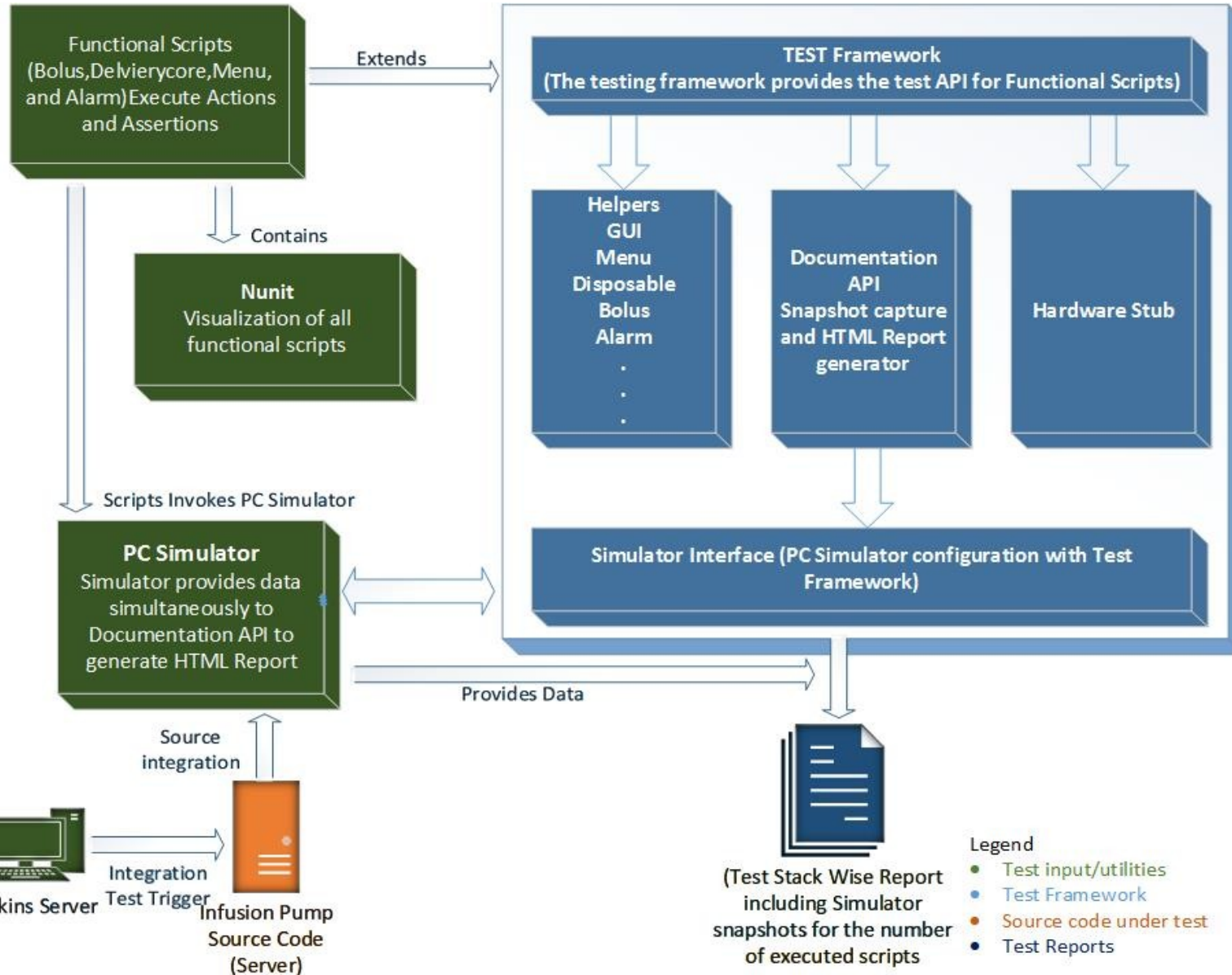
Scope of Testing

Project is intended to perform feature wise testing of the PC Simulator by stubbing the hardware functions.

Integration Test Automation framework features -

- Develop a test framework to test infusion pump features on PC platform stubbing the Hardware dependent modules

- Integrate multiple components and verify their functional dependencies

- Facilitate integration of 3rd party utilities such as Jenkins for periodic triggers

- Provide user with an option to elect the functions/features for testing

- Maintain the test results as PC Simulator screenshots for each test step

- Include an option for User to compare the expected event occurrence at specified test steps (example alarm trigger, reminder messages, etc.)

- Modularity in regards to reuse of APIs related to common test steps across features (example: alarms, therapies, etc.)

- Distribute the test scope for regression suite, sanity suite, functional suite in order to strengthen test coverage as well as operational conditio

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Functional Scripts (Bolus,Delvierycore,Menu, and Alarm)Execute Actions and Assertions

— Extends →

TEST Framework (The testing framework provides the test API for Functional Scripts)

— Contains →

Nunit Visualization of all functional scripts

Helpers GUI Menu Disposable Bolus Alarm · · ·

Documentation API Snapshot capture and HTML Report generator

Hardware Stub

Scripts Invokes PC Simulator

PC Simulator Simulator provides data simultaneously to Documentation API to generate HTML Report

Simulator Interface (PC Simulator configuration with Test Framework)

— Provides Data →

Source integration

Integration Test Trigger

Jenkins Server

Infusion Pump Source Code (Server)

(Test Stack Wise Report including Simulator snapshots for the number of executed scripts)

Legend
- Test input/utilities
- Test Framework
- Source code under test
- Test Reports

Highlights & Benefits

- Infusion system testing framework uses *Nunit* for execution of functional test scripts.

- Segregation of test cases based on features

- Periodic execution independent of   human interface

- Detailed html reports capturing test results along with deviations as screen-capture

- Defect identification with test step-wise PC Simulator screenshot, aiding bug fixing

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