High-Quality Test Framework

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Situation Simulation

Something went wrong, we do the manual test today.

No test report is on the TestRail, please update test result manually.

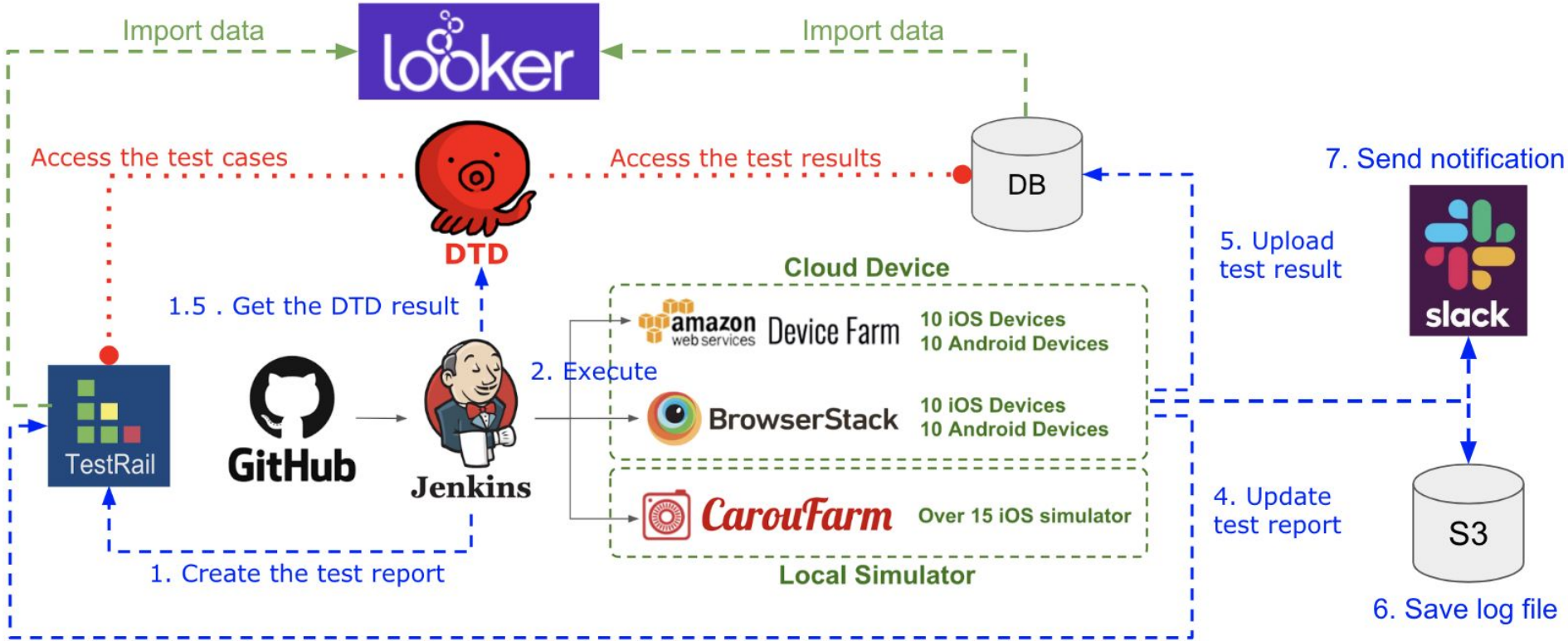
Someone changed my function causing my test case failed.

Test log was not uploaded to our log folder.

Test failed notification was not sent to the Slack channel.

My test cases was not be executed.

The overview of our test framework



What is the condition of a high-quality test framework?

The improvement of our test automation framework

1. The test framework should work stable.

2. Execute each test scenario correctly.

3. The test log, test result, and notification are correct.

How do we achieve our goal?

System Level

- Write unit tests on the service-level features.
- Check everything works normally when requesting a pull request.
- The separation of the code, test configuration, test scenario and test data.

Process level

- Security prevention
- Pull request checklist
- Good code review process
    - Our coding guideline
    - Find the potential risk and issues

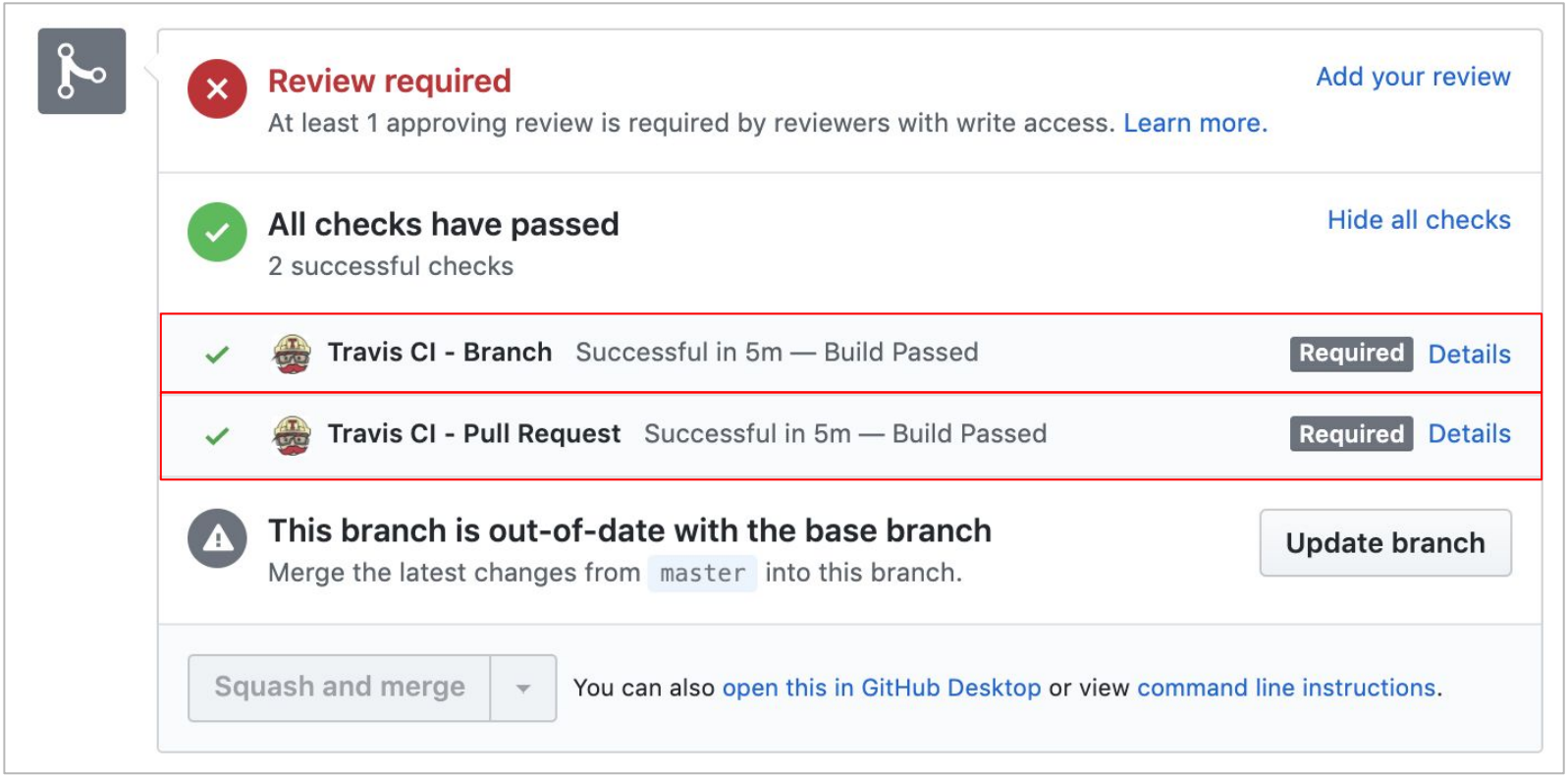
System level - Unit Test

Writing unit tests on the functions below to make sure everything works before/after merging PRs.

- **Service API**
  - Test data preparation
- **Service function**
  - Update Test Result to the Testrail
  - Upload Test Result to the DynamoDB
  - Upload Test Log to the S3
  - Send the notification to the Slack Channel
  - User Service, Listing Service, Wallet Service...etc

System level - CI

Check everything works normally on the Travis CI before code review.



System level - CI

The check steps in the **.travis.yml**

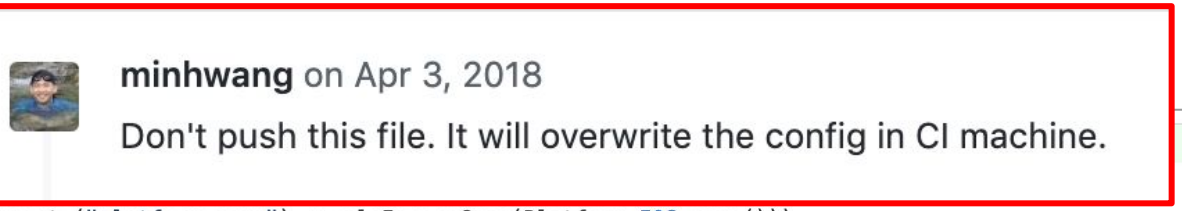
AWS Device Farm

```
16  script:
17    # Build and tests 1. Run unit tests and check coding format...
18    # 1. Does it build?
19    - mvn clean install
20
21    # 2. Can we generate test packages? 2. Test if generating the test package success...
22    - mvn clean -Paws gherkin-processor:process -DawsDynamoAccessKey=$AWS_DYNAMO_ACCESS_KEY -DawsDynamoSecretKey=$AWS_DYNAMO_SECR
23    - mvn clean -Paws gherkin-processor:generate -DawsDynamoAccessKey=$AWS_DYNAMO_ACCESS_KEY -DawsDynamoSecretKey=$AWS_DYNAMO_SEC
24
25    # 3. Can we generate feature files with tags from TestRail 3. Test if generating feature file with tags success...
26    - mvn -Ptags generate-sources -DskipTests=true -DtestrailUrl=$TESTRAIL_URL -DtestrailUsername=$TESTRAIL_USERNAME -DtestrailPa
27
28    # 4. Can we upload test packages? 4. Test if uploading test package success...
29    - mvn clean -Paws -DskipTests=true -DprojectArn=$AWS_DEVICEFARM_PROJECT_ARN -Dplatform=android -DfinalName=travis_test -DappP
30
31    # 5. Can we upload app packages? 5. Test if uploading app package success...
32    - mvn clean -Paws -DskipTests=true -DprojectArn=$AWS_DEVICEFARM_PROJECT_ARN -Dplatform=android -DappPackage=test.apk -DappPac
33
34    # 6. Can we create Testrail runs? 6. Test if creating test report success...
35    - mvn -Ptestrail -Durl=$TESTRAIL_URL -Dusername=$TESTRAIL_USERNAME -Dpassword=$TESTRAIL_PASSWORD -DprojectId=9 -DsuiteId=17 -
```

System level - Test configuration

Separate the test configuration from our repo (code).

Previous version




```
    61  +           capabilities.s
62  62              capabilities.s
63  63              if (System.getProperty("platform_name").equalsIgnoreCase(Platform.IOS.name()))
64  64              {
    @@ -67,8 +67,10 @@ private static void setMobileCapabilities()
67  67                  capabilities.setCapability("wdaLocalPort", Integer.parseInt(System.getProperty("wda_port")));
68  68                  capabilities.setCapability("xcodeOrgId", "8AH82AR7PW");
69  69                  capabilities.setCapability("xcodeSigningId", "iPhone Developer");
70      -               capabilities.setCapability("useNewWDA", true);
    70  +               capabilities.setCapability("useNewWDA", false);
71  71                  capabilities.setCapability("updatedWDABundleId", "io.appium.WebDriverAgentRunner");
    72  +               capabilities.setCapability("bundleId", "com.thecarousell.Carousell");
    73  +               capabilities.setCapability("udid", "656c2decfd3c631ee37d6c685514ff407813345d");
72  74              }
73  75              else if (System.getProperty("platform_name").equalsIgnoreCase(Platform.ANDROID.name()))
74  76              {
```

Problem?

System level - Test configuration

- **Our solution** is to only put a property file template in our repo, everyone need to prepare their property file by following the template on local.
- This property file include any detailed information to execute a test execution. ex: AppiumURL, AutomationName, udid, appPath...
- Load the configuration from property files into environment variable before the test execution.

Current version

```
# Mode (Web or Mobile)
# @deprecated
mode=$mode

# Platform (iOS, Android or Web)
platform=$platform

# Additional tags (the platform will always be added as a tag)
tags=$tags

# Package to load the steps from
stepsPackage=$stepsPackage

# Directory to load the features from
features=$features

# Directory for cucumber reports
cucumberReportDirectory=$cucumberReportDirectory

# Directory for cucumber json files
cucumberJsonDirectory=$cucumberJsonDirectory

# URL of a running Appium server instance
appiumUrl=$appiumUrl

# Path to chrome webdriver (for web testing)
webdriverChromeDriver=

# Headless browser testing (web only)
headless=false

# WDA port
```

System level - Test configuration

- Build up the corresponding capability (DesiredCapabilities)

Benefit ?

```
public CapabilitiesProvider getCapabilitiesProvider() {

  String cloudProvider = System.getProperty(PropertyConstants.CLOUD_PROVIDER);
  if (cloudProvider.equalsIgnoreCase( anotherString: "local")) {
    return new LocalCapabilitiesProvider();
  } else if (cloudProvider.equalsIgnoreCase( anotherString: "aws")) {
    return new AWSCapabilitiesProvider();
  } else if (cloudProvider.equalsIgnoreCase( anotherString: "browserstack")) {
    return new BrowserStackCapabilitiesProvider();
  } else if (cloudProvider.equalsIgnoreCase( anotherString: "caroufarm")) {
    return new GridCapabilitiesProvider();
  } else {
```

System level - Test scenario

Separate the test scenario from our repo (code).

Previous version

```
@case(23110) @ios @android @sanity @regression @wallet
Scenario: SG user can add a bank account
  Given  the user logs in - User account "caroutest_sg.wallet1", Password "p@ssw0rd"
  And the user is on the Manage Your Wallet page
  And the user creates a new bank account - Holder name "Test", Account Number "1234567890", Bank Id "7375" and branch "001"
  Then the user can see new bank account
```

Problem?

Latest version

```
@case(23110)
Scenario: SG user can add a bank account
  Given  the user logs in as "sg_wallet1" by skipping ui login
  And the user is on the Bank Account Detail page
  And the user creates a new bank account - Holder Name "Test", Account Number "1234567890", Bank ID "7375" and Branch "001"
  Then the user sees the new account
```

Benefit?

System level - Test scenario

```
@case(23110)
Scenario: SG user can add a bank account
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  Then the user sees the new account
```

gherkin-processor-maven-plugin


```
@ios @android @sanity @regression @wallet @23110
Scenario: SG user can add a bank account
  Given  the user logs in - User account "caroutest_sg.wallet1", Password "p@ssw0rd"
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  Then the user can see new bank account
```

System level - Test scenario

C23110 SG user can create a back account

Mobile › CarouPay › Wallet

Type	Priority	Estimate	References
Default	Medium	None	TEST-992
Assignee	**Automation Status iOS**	**Automation Status Android**	**Automation Status Web**
Carousell.QA	Stable	Stable	Open
Gherkin file	**Android Video**		
Link	Link		

Platform
iOS, Android --- → @ios @android

Type
Sanity, Regression --- → @sanity @regression

```
@ios @android @sanity @regression @wallet @23110
Scenario: SG user can add a bank account
  Given  the user logs in - User account "caroutest_sg.wallet1", Password "p@ssw0rd"
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Benefit?

System level - Test data

Separate the test data from our repo (code).

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Problem?

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```

Benefit?

System level - Test data

```
@case(23110)
Scenario: SG user can add a bank account
  Given  the user logs in as "sg_wallet1" by skipping ui login
  And the user is on the Bank Account Detail page
  And the user creates a new bank account - Holder Name "Test", Account Number "1234567890", Bank ID "7375" and Branch "001"
  Then the user sees the new account
```

```
@And("^the user logs in as \"([^\"]*)\" by skipping ui login$")
public void theUserLogsInAsBySkippingUiLogin(String userKey) {

  LOG.info("Performing login from the background and navigating
  User user = userService.get(userKey);
  userService.setCurrentUser(user);
  String userName = user.getUsername();
  String password = user.getPassword();
  LOG.info("userName=" + userName);
```

Class UserService

amazon
DynamoDB

System level - Test data

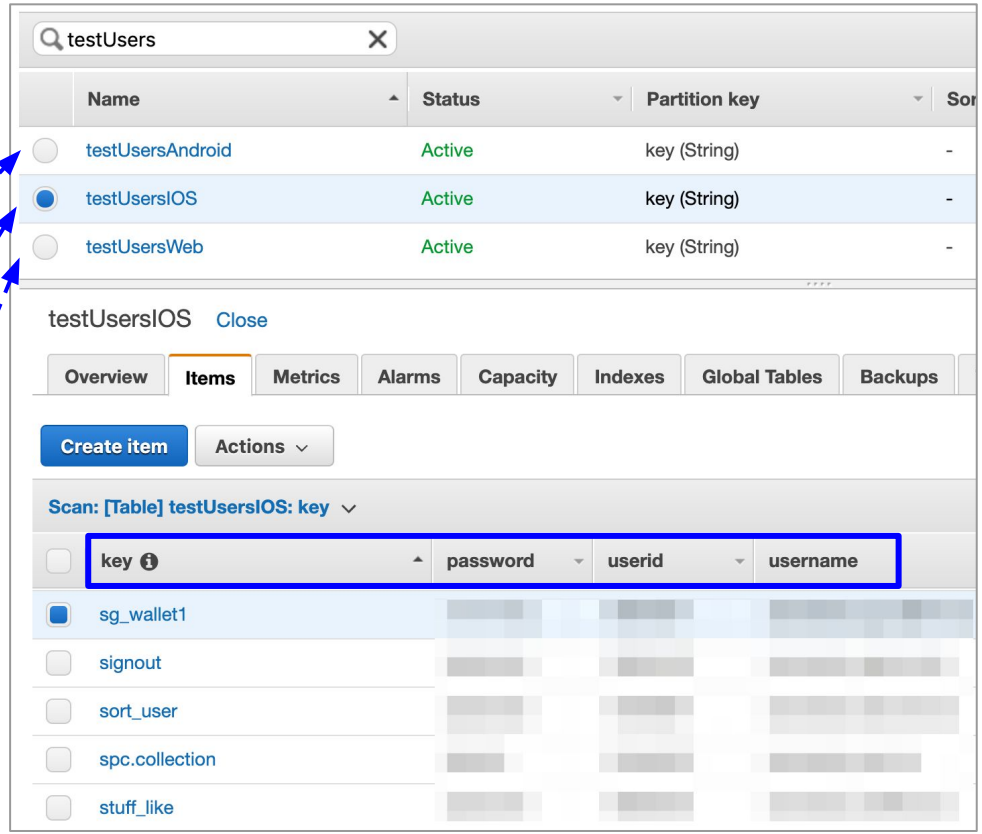
Class UserService

```
…

if (configuration.isAndroid()) {
 dynamoDBTable = "testUsersAndroid";
}

if (configuration.isIOS()) {
 dynamoDBTable = "testUsersIOS";
}

if (configuration.isWeb()) {
 dynamoDBTable = "testUsersWeb";
}
…
```

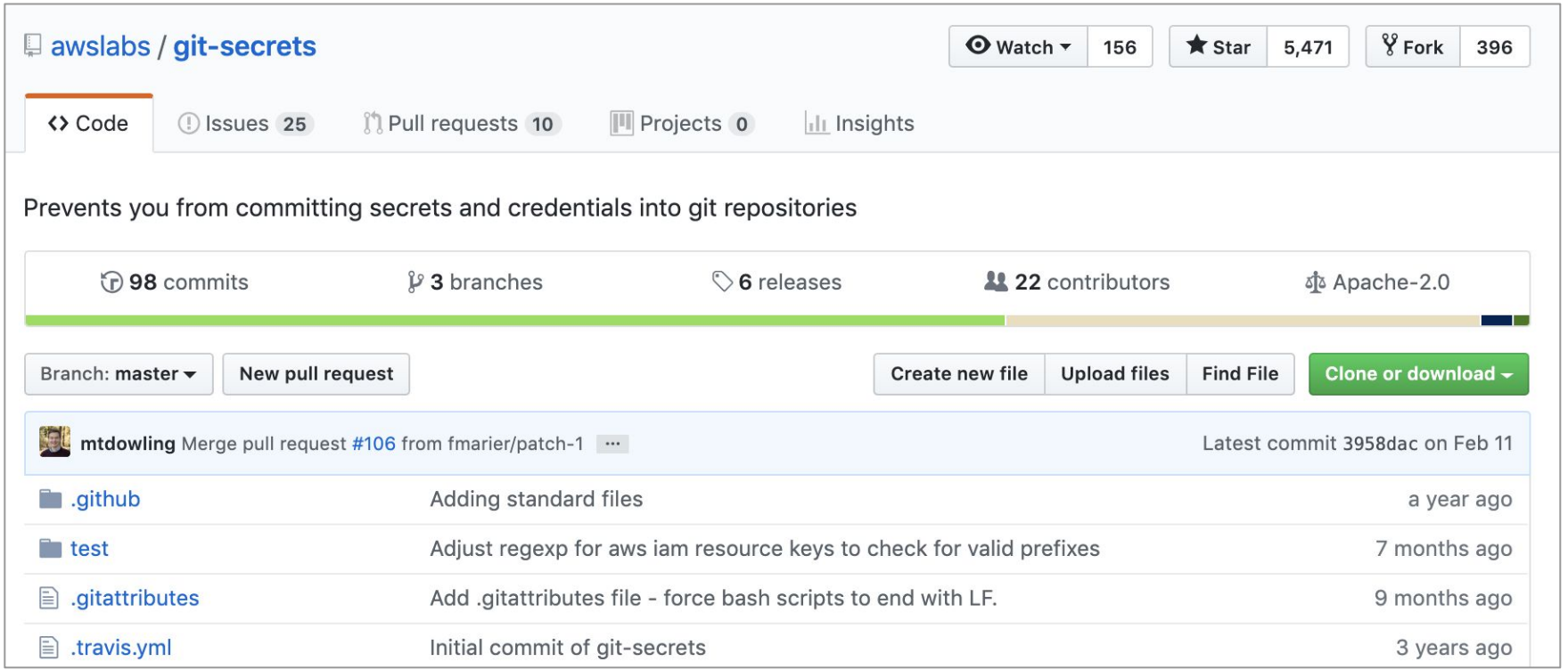


Process level

- Security Prevention
- PR CheckList
- Coding formatting
- Code Review Process

Process level - Security Prevention

Use the git-secrets to avoid exposing your keys, password ...etc



Process level - Security Prevention

```
~/MyRepository/qa-dtd  docker +  git status
On branch docker
Your branch is up to date with 'origin/docker'.

Changes to be committed:
  (use "git reset HEAD <file>..." to unstage)

        new file:   Dockerfile
        modified:   src/main/java/io/github/carousell/qadtd/beans/DTDResponse.java
        modified:   src/main/java/io/github/carousell/qadtd/model/TestDevice.java
        modified:   src/main/java/io/github/carousell/qadtd/model/TestScenario.java
        modified:   src/main/java/io/github/carousell/qadtd/service/TestDistributorAWS.java

~/MyRepository/qa-dtd  docker +  git commit -m "update the dockerfile and a new function of getting total test case number"
src/main/java/io/github/carousell/qadtd/beans/DTDResponse.java:38:  private String awsAccessKey = '[redacted]
src/main/java/io/github/carousell/qadtd/beans/DTDResponse.java:39:  private String awsSecretKey = '[redacted]";

[ERROR] Matched one or more prohibited patterns

Possible mitigations:
- Mark false positives as allowed using: git config --add secrets.allowed ...
- Mark false positives as allowed by adding regular expressions to .gitallowed at repository's root directory
- List your configured patterns: git config --get-all secrets.patterns
- List your configured allowed patterns: git config --get-all secrets.allowed
- List your configured allowed patterns in .gitallowed at repository's root directory
- Use --no-verify if this is a one-time false positive
```

Process level

- PR Checklist

  Build up a flexible verified process to make sure you have already tested and checked everything on your PR.

Process level - PR Checklist

Prepare a checklist (**pull_request_template.md**) in our repository.

```
1
2  **Description:**<br>
3  *Please include a summary of the change.*
4
5  **Related JIRA issue/user story tickets:**<br>
6  *ticket links here*
7
8  **Testing:**
9
10 - [ ] Passed locally for Android
11 - [ ] Passed locally for iOS
12 - [ ] Passed locally for Web
13 - [ ] Checked and tested if changes impacts builds on Browserstack / Caroufarm
14
15 **Checklist:**
16
17 - [ ] If you have made changes in step methods, did you check if change is required in feature files?
18 - [ ] If you have created a new test account for a scenario, have you added/updated account details in DynamoDB user table?
19 - [ ] Documentation completed
20 - [ ] Code formatting done - `mvn fmt:format`
21 - [ ] Local build is successful  - `mvn clean test`
22 - [ ] Finally, does my PR include all necessary files? - `git status` ;)
23
```

Describe your PR

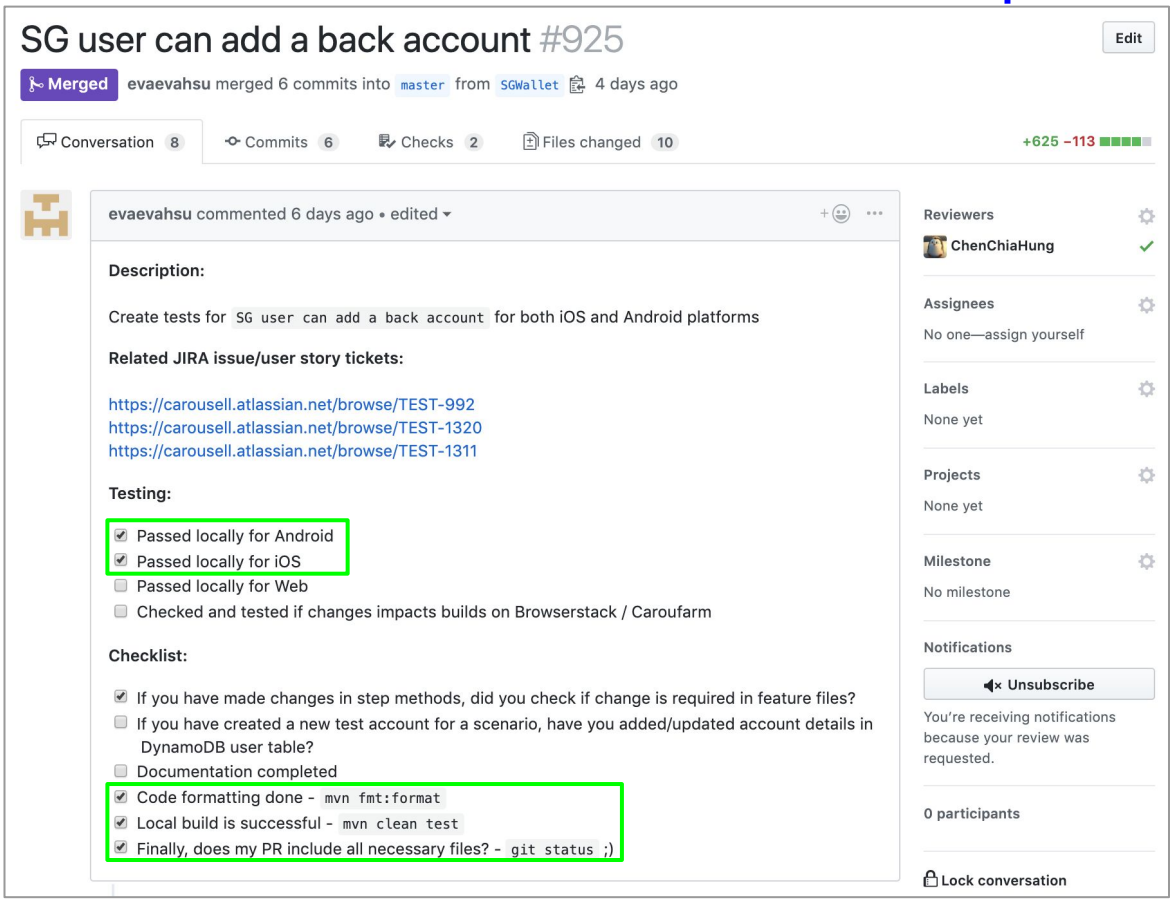
Link related JIRA ticket

Test your PR locally

Check everything in your PR

Process level - PR Checklist

Our practice



SG user can add a back account #925

Edit

Merged evaevahsu merged 6 commits into `master` from `SGWallet` 4 days ago

Conversation 8 | Commits 6 | Checks 2 | Files changed 10 | +625 −113

evaevahsu commented 6 days ago • edited

Description:

Create tests for `SG user can add a back account` for both iOS and Android platforms

Related JIRA issue/user story tickets:

https://carousell.atlassian.net/browse/TEST-992
https://carousell.atlassian.net/browse/TEST-1320
https://carousell.atlassian.net/browse/TEST-1311

Testing:

- [x] Passed locally for Android
- [x] Passed locally for iOS
- [ ] Passed locally for Web
- [ ] Checked and tested if changes impacts builds on Browserstack / Caroufarm

Checklist:

- [x] If you have made changes in step methods, did you check if change is required in feature files?
- [ ] If you have created a new test account for a scenario, have you added/updated account details in DynamoDB user table?
- [ ] Documentation completed
- [x] Code formatting done - `mvn fmt:format`
- [x] Local build is successful - `mvn clean test`
- [x] Finally, does my PR include all necessary files? - `git status` ;)

Reviewers
ChenChiaHung ✓

Assignees
No one—assign yourself

Labels
None yet

Projects
None yet

Milestone
No milestone

Notifications
Unsubscribe
You're receiving notifications because your review was requested.

0 participants

Lock conversation

Process level - Code Formatting

- Everyone's IDE has different code format settings.

Problem?

```
    awsDynamoAccessKey, awsDynamoSecretKey, finalName);
if (awsDynamoAccessKey == "$awsDynamoSecretKey" || awsDynamoSecretKey == "$awsDynamoSecretKey"
    || finalName == "$finalName" || awsDynamoAccessKey == null || awsDynamoSecretKey == null
    || finalName == null || awsDynamoAccessKey == "" || awsDynamoSecretKey == ""
```

```
+        awsDynamoAccessKey,
+        awsDynamoSecretKey,
+        finalName);
+    if (awsDynamoAccessKey == "$awsDynamoSecretKey"
+        || awsDynamoSecretKey == "$awsDynamoSecretKey"
+        || finalName == "$finalName"
+        || awsDynamoAccessKey == null
+        || awsDynamoSecretKey == null
+        || finalName == null
+        || awsDynamoAccessKey == ""
+        || awsDynamoSecretKey == ""
```

```
    || finalName == "") {
  LOG.info("Set isTestRailFlowEnable as False");
  return false;
```

```
        || finalName == "") {
      LOG.info("Set isTestRailFlowEnable as False");
      return false;
```

Process level - Code Formatting

- Our solution is to format your code by this maven-plugin

If you do not format your code, you can not pass the check of Travis CI.

build passing | license MIT | maven central 2.8

fmt-maven-plugin

Formats your code using google-java-format which follows Google's code styleguide.

The format cannot be configured by design.

If you want your IDE to stick to the same format, check out the available configuration files

- Eclipse
- IntelliJ IDEA

Process level

- Code Review Process

  ➢ Follow our coding guideline

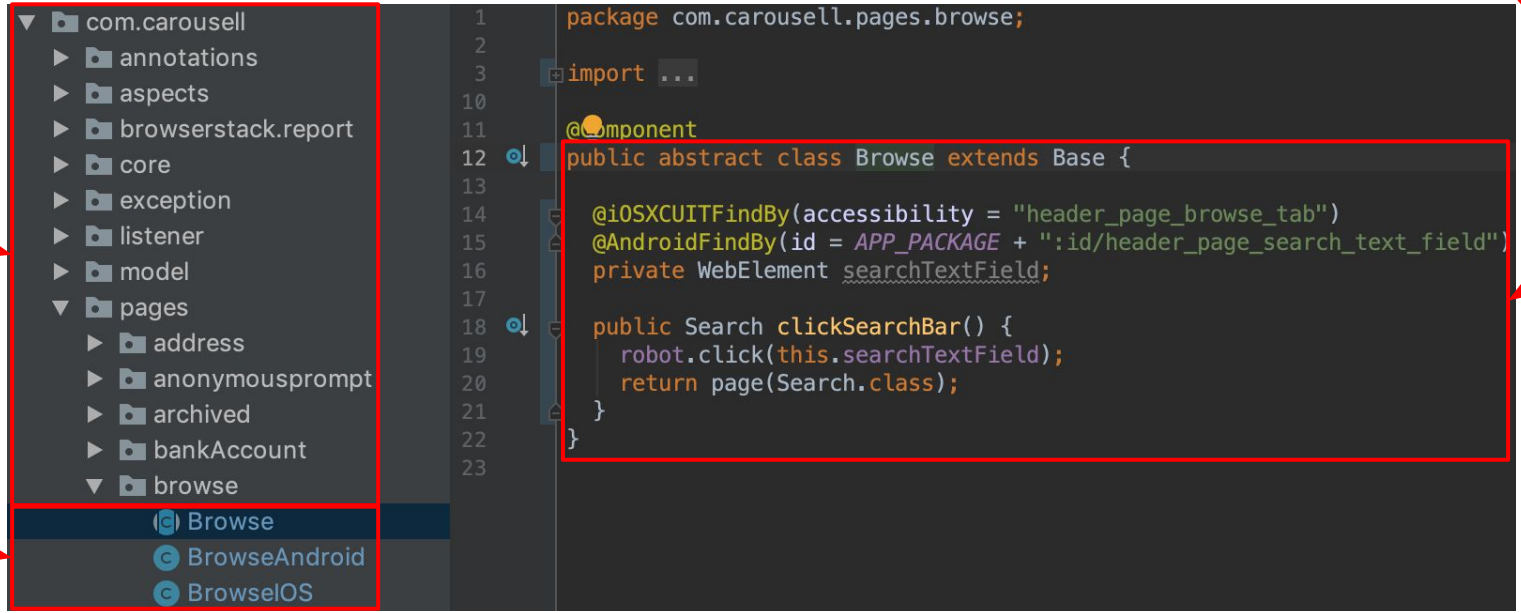
  A basic guideline make everyone on the same page to implement features in our test framework.

  ➢ Open your mind to discuss the code design if any risks and doubt

  ➢ Schedule a plan (Create JIRA tickets) to fix the tech debts time after time

Process level - Our coding guideline

- Naming convention
  - ➤ Use camel case for classes, methods and fields.
  - ➤ Page objects should be named without Page, PageObject or Screen suffix.
  - ➤ Don't use any uppercase letters in package names.



Process level - Our coding guideline

- Code structure

Feature level - User story

Step level - User behavior

Page level - Page control

Framework level - Detail operation

Do not expose the detail operation on the high level class

```
@case(23110)
Scenario: SG user can add a bank account
  Given the user logs in as "sg_wallet1" by skipping ui login
  And the user is on the Bank Account Detail page
  And the user creates a new bank account - Holder Name "Test",
  Then the user sees the new account
```

```
@When("^the user is on the Bank Account Detail page$")
public void theUserIsOnBankAccountDetailPage() {
  page(MePage.class)
          .clickOnMeTab()
          .clickPopupOnNewProfile()
          .clickWalletButton()
          .clickManageButton();
}
```

```
/** Click on Me tab */
public MePage clickOnMeTab() {
  robot.click(meTab);
  return this;
}
```

```
public void click(WebElement element) {
  LOG.info("Entering click(WebElement element={})", element);
  click(element, DEFAULT_VISIBILITY_TIMEOUT);
  LOG.info("Leaving click(WebElement element={})", element);
}
```

Process level - Our coding guideline

- Page objects

➤ Always return an instance of the page after the method finished.

➤ If the action does not navigate to another page/screen use `return this`.

```
public void clickWalletButton() {
  robot.click(walletButton);
}
```

```
public WalletPage clickWalletButton() {
  robot.click(walletButton);
  return page(WalletPage.class);
}
```

```
public MePage clickOnMeTab() {
  robot.click(meTab);
  return this;
}
```

```
@When("^the user is on the Bank Account Detail page$")
public void theUserIsOnBankAccountDetailPage() {
  page(MePage.class)
          .clickOnMeTab()
          .clickPopupOnNewProfile()
          .clickWalletButton()
          .clickManageButton();
}
```

Method Chaining

Process level - Our coding guideline

- Avoid unused imports

```
package com.carousell.pages.address;

import com.carousell.model.Address;
import com.carousell.pages.BasePage;
import io.appium.java_client.MobileElement;
import io.appium.java_client.pagefactory.AndroidFindBy;
import io.appium.java_client.pagefactory.iOSXCUITFindBy;
import java.util.List;
import org.openqa.selenium.WebElement;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.stereotype.Component;
import com.carousell.pages.UserProfilePage;
import com.carousell.pages.CategoryPage

@Component
public abstract class AddressPage extends BasePage {
```

Unused import statement

Process level - Our coding guideline

- Avoid commented-out code

```
/**
 * Use GET method to query an endpoint
 *
 * @param request composed by io.restassured.specification.RequestSpecification
 * @param url endpoint
 * @param timeoutSecs timeout for retry
 * @param expectedResponse use HttpStatus.SC_OK... as arg
 * @return
 */
//  public Response doGet(
//      RequestSpecification request, String url, int timeoutSecs, int expectedResponse) {
//    timer = new TimeMonitor();
//    timer.setStartTime(System.currentTimeMillis());
//    Response response = null;
//    do {
//      response = request.get(url);
//      timer.setElapsedTime(System.currentTimeMillis());
//    } while ((response.getStatusCode() != expectedResponse)
//        && (!isTimoOut(timer.getDuration(), timeoutSecs)));
//    LOG.info("Receiving the response : {}", response.getBody());
//    return response;
//  }
```

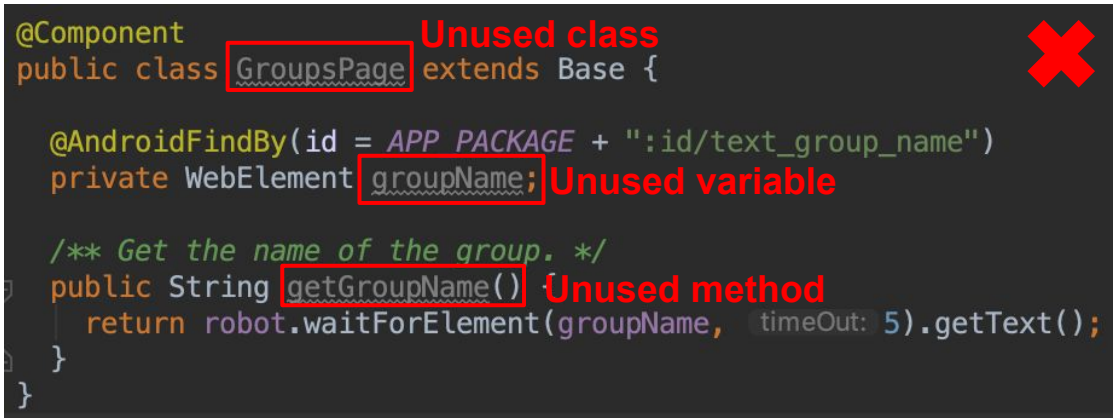
Process level - Our coding guideline

- Avoid unused code

```
/** Get Listing Title from product listing by index */
public String getListingTitleOnProductListByIndex(int index) {
  // By byLocator = (By)MobileBy.AccessibilityId("product_card_itemname_label");
  try {
    // List<MobileElement> TitleList = driver.findElements(byLocator);
    LOG.info("ListingTitleList Size : {}", TitleList.size());
    String title = robot.getAttribute(TitleList.get(index - 1), attributeName: "value");
    LOG.info("title : {}", title);
    return title;
  } catch (NoSuchElementException | IndexOutOfBoundsException | CarouLionException e) {
    LOG.warn(
        "[getListingTitleFromProductListByIndex] Something Wrong ! Return Null ! , Excep
        e.getMessage());
    return null;
  }
}
```

Process level - Our coding guideline

- Avoid unused class, variable and function



Process level - Our coding guideline

- Javadoc (Google Java Guide)

```
/**
 * Use POST method to query an endpoint
 *
 * @param request composed by io.restassured.specification.RequestSpecification
 * @param url endpoint
 * @param timeoutSecs timeout for retry
 * @param expectedResponse use HttpStatus.SC_OK... as arg
 * @return
 */
public Response doPost(
    RequestSpecification request, String url, int timeoutSecs, int expectedResponse) {
  timer = new TimeMonitor();
  timer.setStartTime(System.currentTimeMillis());
  Response response = null;
  do {
    response = request.post(url);
    timer.setElapsedTime(System.currentTimeMillis());
  } while ((response.getStatusCode() != expectedResponse)
      && (!isTimoOut(timer.getDuration(), timeoutSecs)));
  LOG.info("Receiving the response : {}", response.getBody());
  return response;
}
```

Process level - Our coding guideline

- Logging
  - ➤ ~~System.out.println()~~
  - ➤ Use a logging framework
  - ➤ Think about a suitable log level (DEBUG, INFO, WARN, ERROR)

```
if (getSecretValueRequest == null) {
  LOG.error("Secret {} does not exist in AWS Secrets Manager", secretName);
  return null;
}
```

Process level - Our coding guideline

- Exception handling
  - ➢ Never catch all exceptions.
    Think about which one(s) could be thrown and handle this/these.
  - ➢ Use proper logging with a meaningful message.
  - ➢ Think about if the exception should fail the current test or not.

```
try {
   robot.click(okGotItInCateforyPage);
} catch (Exception e) {
}
```

```
try {
   List<WebElement> targetList = driver().findElements(byLocator);
   LOG.info("targetList Size : {}", targetList.size());
   return (targetList.size() == 1) && (robot.isDisplayed(targetList.get(0)));
} catch (NoSuchElementException | IndexOutOfBoundsException e) {
   LOG.warn("Something Wrong ! Return false ! , Exception : {}", e.getMessage());
   return false;
}
```

Process level - Case Study

- Red block sometimes throws a NullPointerException which leads to the following steps not being executed.

```
// Upload the log file to S3
if (s3Service.isEnableS3Service()) { Upload the log to S3
  awsS3LogPathLink = loggingService.uploadJavaLogFile(logFileName);
}
// Get the browserstack session link here  Get the sessionID from BrowserStack
AppiumDriver appiumDriver = (AppiumDriver) webDriverProvider.getWebDriver();
String browserstackSessionUrl = browserstackService
        .getBrowserStackSessionUrlFromAppiumSessionId(appiumDriver.getSessionId().toString());
// Upload the test result to the TestRail
if (testRailService.isTestRailFlowEnable()) {
    updateBstackTestResultToTestRail(scenario, awsS3LogPathLink, browserstackSessionUrl);
    testId = testRailService.getLatestTestResult().getTestId();
    testRailService.clearLatestTestResult(); Update the test result to TestRail
}
// Upload the test result to the dynamoDB
if (configuration.isRunningOnClouds()) { Upload the test result to DynamoDB
  testResultService.storeTestResultToDynamoDB(createTestResult(scenario, awsS3LogPathLink));
}
// Send SlackNotification
if (configuration.isSlackEnabled()) {
  updateTestResults(scenario, awsS3LogPathLink)Send Notification to the Slack channel
  sendSlackNotification(scenario, testId);
}
```

Process level - Case Study

1. Red block will not be executed to clear test data If throw AssertionError.

2. Red block should be executed in the teardown step

3. Not each scenario need to execute this step, so we need to create a new service class to handle this detail operation.

```
@Then("^the user sees the new account$")
public void theUserSeesTheNewAccount() {
  Assertions.assertThat(page(SGBankAccountPage.class).isBankAccountCorrect(session.getSessionData("expectedSGAccountNumber").toString()
          .isTrue();
  Assertions.assertThat(page(SGBankAccountPage.class).isBankNameCorrect(session.getSessionData("expectedSGBankName").toString()))
          .isTrue();

  carousellAPI.getSGWalletSetting(session.getSessionData("token").toString());
  carousellAPI.deleteSGWalletSetting(session.getSessionData("token").toString(), session.getSessionData("id").toString());
}
```

Thanks for your attention!