WEEK 4 UNIT 4
WRITING INTEGRATION TEST WITH OPA

Please perform the exercises below in your app project as shown in the video.

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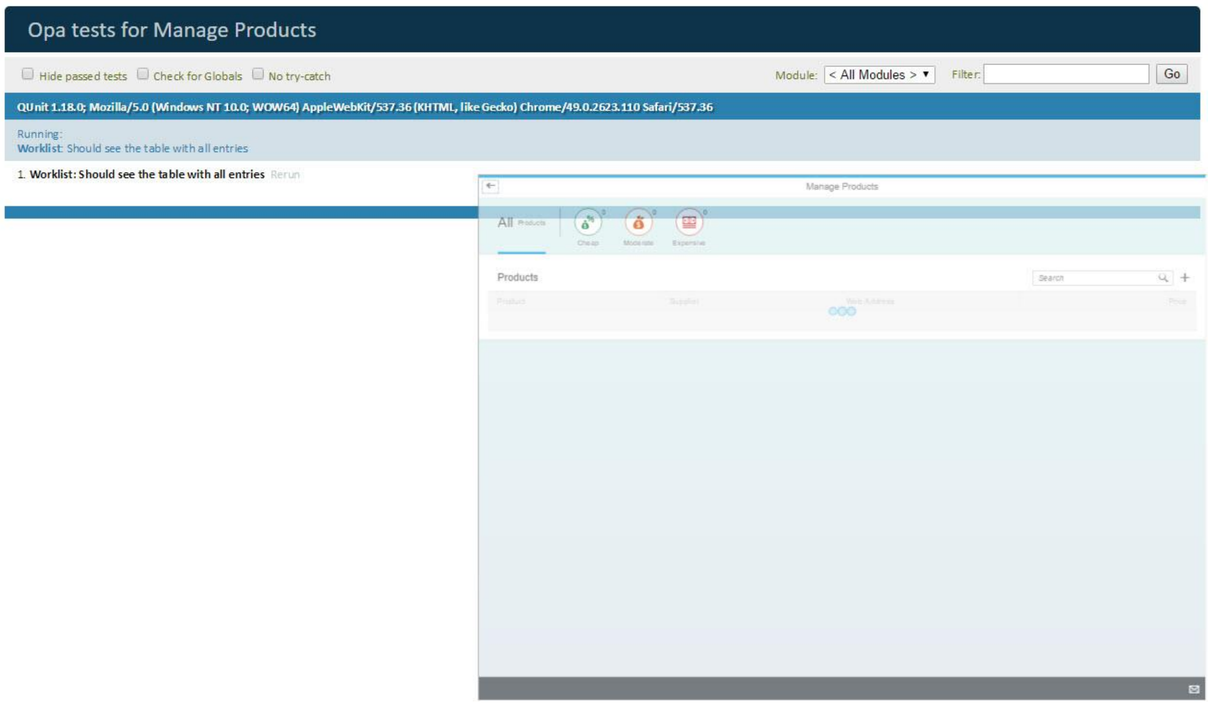
Preview


Opa tests for Manage Products

Hide passed tests Check for Globals No try-catch Module: < All Modules > Filter: Go

QUnit 1.18.0; Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/49.0.2623.110 Safari/537.36

Running:
Worklist: Should see the table with all entries

1. Worklist: Should see the table with all entries Rerun

Figure 1 - Preview of the app after doing this unit's exercises

1 ADD A NEW OPA TEST

Let us now add our own OPA test to the `Worklist` journey. You may have noticed that the products list displays a ‘plus’ button next to the search field in the header toolbar. We would like to write a simple OPA test to check whether this button opens the ‘Add’ view.

webapp/test/integration/pages/Worklist.js

```
…
var sViewName = "Worklist",
   sTableId = "table",
   sAddButtonId = "addButton",
   sSearchFieldId = "searchField",
   sSomethingThatCannotBeFound = "*#-Q@@||",
…
```

First add the add button id to the variable declaration. You can find this id in the file ‘Worklist.view.xml’.

webapp/test/integration/pages/Worklist.js

```
sap.ui.define([
      "sap/ui/test/Opa5",
      "sap/ui/test/actions/Press",
      "sap/ui/test/actions/EnterText",
      "sap/ui/test/matchers/AggregationLengthEquals",
      "sap/ui/test/matchers/AggregationFilled",
      "sap/ui/test/matchers/PropertyStrictEquals",
      "opensap/manageproducts/test/integration/pages/Common",
      "opensap/manageproducts/test/integration/pages/shareOptions"
   ], function(Opa5, Press, EnterText, AggregationLengthEquals,
AggregationFilled, PropertyStrictEquals, Common, shareOptions) {

…
Opa5.createPageObjects({

   onTheWorklistPage : {
      baseClass : Common,
      actions :
         …
         iSearchForSomethingWithNoResults : function () {
            return this.iSearchForValue([new EnterText({text:
sSomethingThatCannotBeFound}), new Press()]);
         },

         iPressAdd : function () {
            return this.waitFor({
               id: sAddButtonId,
               viewName : sViewName,
               actions : new Press(),
               errorMessage : "Add button not found"
            });
         },
…
```

Now we can append our `iPressAdd` function to the ‘actions’ section of the Worklist page. This function consists of a `waitFor` statement that checks for controls with id ‘addButton’ inside the ‘worklist’ view. Once the button is found, `waitFor` executes the `Press` action for the ‘Add’ button.

The `Press` action will not only trigger the ‘tap’ event on the button. In addition it makes sure that the button gets the focus. If the button is not visible, which is a common source of errors, the `Press` action will log an error.

2 ADD A NEW OPA PAGE OBJECT

webapp/test/integration/pages/NewProduct.js (NEW)

```
sap.ui.require([
     "sap/ui/test/Opa5",
     "opensap/manageproducts/test/integration/pages/Common"
  ], function(Opa5, Common) {
     "use strict";

     var sViewName = "Add",
        sPageId = "page";


     Opa5.createPageObjects({
        onTheNewProductPage : {
           baseClass : Common,

           assertions : {
              iShouldSeeThePage : function () {
                 return this.waitFor({
                    id : sPageId,
                    viewName : sViewName,
                    success: function () {
                       Opa5.assert.ok(true, "The 'New Product' title is
shown.");
                    },
                    errorMessage : "Did not display the 'New Product' page."
                 });
              }
           }
        }
     });
  }
);
```

Now we can proceed by adding a new page object for new products. OPA uses page objects to structure its journeys. Typically each page object contains actions and assertions which are for controls in one view. In our case, this would be the 'Add' view.

We implement our assertion `iShouldSeeThePage` which checks whether the 'page' is displayed . Again this is done by a `waitFor` statement which checks in the DOM tree whether the entry 'page' is available in the 'Add' view. In this case, the `success` function is called, which executes a QUnit `assert.ok`. If not, an error message is displayed and the test fails.

webapp/test/integration/AllJourneys.js

```
…
sap.ui.require([
     "sap/ui/test/Opa5",
     "opensap/manageproducts/test/integration/pages/Common",
     "sap/ui/test/opaQunit",
     "opensap/manageproducts/test/integration/pages/NewProduct",
     "opensap/manageproducts/test/integration/pages/Worklist",
  …
  ],
…
```

To make sure our new page is loaded, we need to require it in 'AllJourneys.js'

webapp/test/integration/ObjectJourney.js

```
sap.ui.define([
     "sap/ui/test/opaQunit"
   ], function (opaTest) {
     "use strict";

     QUnit.module("Object");

     …

     opaTest("Should see the 'New Product' view after pressing the 'Add'
button", function (Given, When, Then) {
        // Arrangements
        Given.iStartMyApp();
        //Actions

   When.onTheWorklistPage.iWaitUntilTheTableIsLoaded().and.iPressAdd();
        //Assertions

   Then.onTheNewProductPage.iShouldSeeThePage().and.iTeardownMyAppFrame();
     });
   }
);
```

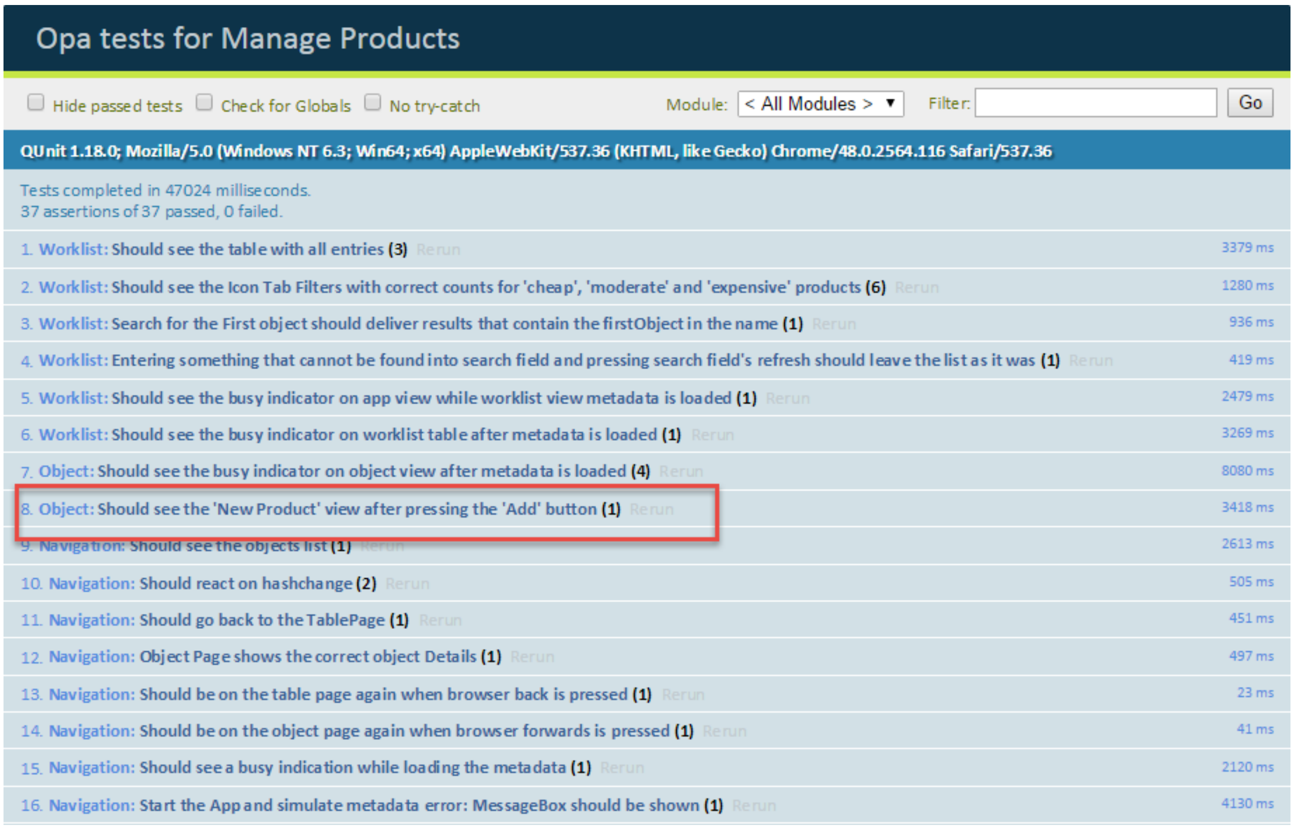
We are all set now to write our OPA test. Let us add it to the 'ObjectJourney'. A journey consists of a series of integration tests that belong to the same context such as navigating through the app. Similar to the QUnit test implementation, OPA5 uses QUnit, that's why we first set up a QUnit module 'Object' that will be displayed on our result page.

The function `opaTest` is the main aspect for defining integration tests with OPA. Its parameters define a test name and a callback function that gets executed with the following OPA5 helper objects to write meaningful tests that read like a user story.

- Given: on the given object we can call arrangement functions like `iStartMyApp` to load our app in a separate iFrame for integration testing.
- When: contains custom actions that we can execute to get the application in a state where we can test the expected behavior.
- Then: contains custom assertions that check a specific constellation in the application, and the teardown function that removes our iFrame again.

In our test, we first start the app and wait for the table to be populated on the worklist page. Then we press the 'Add' button on the worklist page. After that, we check whether the new product page is displayed. Finally, we remove the iFrame again from our test page.

As you can see, the test case reads like a user story. We actually do not need the implementation of the methods yet to understand the meaning of the test case. This approach is called "Behavior Driven Development" or simply BDD and is popular in "Agile Software Development".



Opa tests for Manage Products

Hide passed tests Check for Globals No try-catch Module: < All Modules > Filter: Go

QUnit 1.18.0; Mozilla/5.0 (Windows NT 6.3; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/48.0.2564.116 Safari/537.36

Tests completed in 47024 milliseconds.
37 assertions of 37 passed, 0 failed.

1. Worklist: Should see the table with all entries (3) Rerun — 3379 ms
2. Worklist: Should see the Icon Tab Filters with correct counts for 'cheap', 'moderate' and 'expensive' products (6) Rerun — 1280 ms
3. Worklist: Search for the First object should deliver results that contain the firstObject in the name (1) Rerun — 936 ms
4. Worklist: Entering something that cannot be found into search field and pressing search field's refresh should leave the list as it was (1) Rerun — 419 ms
5. Worklist: Should see the busy indicator on app view while worklist view metadata is loaded (1) Rerun — 2479 ms
6. Worklist: Should see the busy indicator on worklist table after metadata is loaded (1) Rerun — 3269 ms
7. Object: Should see the busy indicator on object view after metadata is loaded (4) Rerun — 8080 ms
8. Object: Should see the 'New Product' view after pressing the 'Add' button (1) Rerun — 3418 ms
9. Navigation: Should see the objects list (1) Rerun — 2613 ms
10. Navigation: Should react on hashchange (2) Rerun — 505 ms
11. Navigation: Should go back to the TablePage (1) Rerun — 451 ms
12. Navigation: Object Page shows the correct object Details (1) Rerun — 497 ms
13. Navigation: Should be on the table page again when browser back is pressed (1) Rerun — 23 ms
14. Navigation: Should be on the object page again when browser forwards is pressed (1) Rerun — 41 ms
15. Navigation: Should see a busy indication while loading the metadata (1) Rerun — 2120 ms
16. Navigation: Start the App and simulate metadata error: MessageBox should be shown (1) Rerun — 4130 ms

Figure 2 - The OPA test result page

Let us execute our new OPA test: Select the file ‘opaTest.qunit.html’ in the folder test/integration of your SAP Web IDE project and run it, or select the run configuration ‘run OPA tests’ from the ‘run’ menu.

You will see a QUnit result page and a preview of the app where the tests are executed on. At the end of the ‘Worklist’ journey, the new test is executed.

Related Information

[API Reference: sap.ui.test.OPA5]
[API Reference: sap.ui.test.matchers]