# Test Suite of

# Software Patch Management

# Web Application

**Sponsored by: Coupa Software**

*Team members:*

Amruta Gadgil

Fei Hao

Pramothini Dhandapany

*Faculty advisor:*

Patrick Tague ([tague@cmu.edu](mailto:tague@cmu.edu))

December 11, 2015

# Table of Contents

1. Test suite for Input file (CSV) validation 3

2. Test suite for Asset page functionalities 7

3. Test suite for Reports page functionalities 8

4. Test suite for Dashboard page functionalities 9

5. Test suite for User Settings page functionalities and user authentication 11

6. Test suite for User Registration 14

### 1. Test suite for Input file (CSV) validation

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected result** |
| Verify that the system does not accept empty upload. | 1. Click "Upload" button directly without browsing and selecting file. | A message box should be popped up with alert message "Empty input! Not allowed!" |
| Verify that the system does not accept empty file. | 1. Click “Browse”.  2. In the popped up explorer, select file that is empty [suppose the selected file is test\_file1.csv].  2. Click “Upload”. | A message box should be popped up with alert message "Empty input! Not allowed!" |
| Verify that the system does not accept file with suffix other than “.csv”. | 1. Click “Browse”.  2. In the popped up explorer, select file that has suffix of anything other than “.csv” [suppose the selected file is notCSV.pdf].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate notCSV.pdf... failed!  Error: notCSV.pdf is NOT a csv file!” |
| Verify that the system does not accept file with size larger than 50MB. | 1. Click “Browse”.  2. In the popped up explorer, select file that has size larger than 50MB [suppose the selected file is test\_file2.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file2.csv... failed!  Error: test\_file2.csv size too big for processing! File size limit: 50MB.” |
| Verify that the system does not accept file that does not have header row (row with its first column value as “IP”). | 1. Click “Browse”.  2. In the popped up explorer, select file that has does not have a row with its first column value as “IP” [suppose the selected file is test\_file3.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file3.csv... failed!  Error: test\_file3.csv does not have a header with the 1st field as [IP]!” |
| Verify that the system does not accept file that has the required header but has no useful data (the header row is the last row). | 1. Click “Browse”.  2. In the popped up explorer, select file that has the required header but has no useful data [suppose the selected file is test\_file4.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file4.csv... failed!  Error: test\_file4.csv has no useful data! |
| Verify that the system does not accept file with a header row started with “IP” field, but missing one or more other required fields. | 1. Click “Browse”.  2. In the popped up explorer, select file that has the required header but has no useful data [suppose the selected file is test\_file6.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file6.csv… failed!  Errors: Row 8: Missing fileds [CVE ID] [DNS] in header!   Found 1 problem in total.” |
| Verify that the system does not accept file with a header row started with “IP” field, but has field(s) that is/are not the required field(s). | 1. Click “Browse”.  2. In the popped up explorer, select file that has the required header but has no useful data [suppose the selected file is test\_file7.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file7.csv… failed!  Errors: Row 8: Unexpected fields [FooField] [BarField] in header!  Found 1 problem in total.” |
| Verify that the system does not accept file that has row(s) with incorrect record length (number of columns of the row). | 1. Click “Browse”.  2. In the popped up explorer, select file that has row(s) with incorrect record length [suppose the selected file is test\_file8.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file8.csv... failed!  Errors: Row 306: Record length is 27, expected to be 25! Row 361: Record length is 23, expected to be 25!  Found 3 problem in total.” |
| Verify that the system does not allow empty IP value in the uploaded file. | 1. Click “Browse”.  2. In the popped up explorer, select file that has row(s) with empty IP value [suppose the selected file is test\_file10.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file10.csv... failed!  Row 477: Empty IP value! Not allowed!  Found 3 problem in total.” |
| Verify that the system does not allow invalid IP value (not numbers, not in xxx.xxx.xxx.xxx format, numbers larger than 255) in the uploaded file. | 1. Click “Browse”.  2. In the popped up explorer, select file that has row(s) with invalid IP value [suppose the selected file is test\_file11.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file11.csv... failed!  Errors: Row 141: Invalid IP value [abc.abc.abc.abc], expected to be between 0.0.0.0 and 255.255.255.255! Row 186: Invalid IP value [10.1.14], expected to be between 0.0.0.0 and 255.255.255.255! Row 267: Invalid IP value [10.1.12.999], expected to be between 0.0.0.0 and 255.255.255.255!  Found 3 problem in total.” |
|
|
| Verify that the system does not allow empty severity value in the uploaded file. | 1. Click “Browse”.  2. In the popped up explorer, select file that has row(s) with empty severity value [suppose the selected file is test\_file12.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file12.csv... failed!  Row 16: Empty severity value! Not allowed!  Found 1 problem in total.” |
| Verify that the system does not allow invalid severity value (not numbers, not between 0 and 10, numbers larger than 255) in the uploaded file. | 1. Click “Browse”.  2. In the popped up explorer, select file that has row(s) with invalid severity value [suppose the selected file is test\_file13.csv].  3. Click “Upload”. | A message box should be popped up with alert message as  “Validate test\_file13.csv... failed!  Errors: Row 38: Invalid severity value [13], expected to be between 1 and 10! Row 110: Invalid severity value [a], expected to be between 1 and 10!  Found 2 problem in total.” |
|
|
|
|

### 2. Test suite for Asset page functionalities

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected Result** |
| Verify that the system could search assets IP with valid keyword (numbers and dots only). | 1. Input valid keyword [like “10.12”] in search box.  2. Press the “enter” key on keyboard. | The asset table should show only assets with IP address that matches “10.12”. |
| Verify that the system does not accept searching keyword with invalid characters (other than numbers and dots). | 1. Input searching keyword with invalid characters [like “10.\*$abc”] in search box.  2. Press the “enter” key on keyboard. | The asset table should not be changed. |
| Verify that the system does not accept searching keyword longer than 15 characters. | 1. Input searching keyword longer than 15 characters [like “10.12.112.59.240000”] in search box.  2. Press the “enter” key on keyboard. | After 15 characters, cannot input any character.  The asset table should not be changed. |
| Verify that importance-rating stars are working. | 1. Hover the cursor above the stars.  2. Click cursor on one star. | Stars left of and clicked by the cursor should be highlighted; star right of the cursor should be in disabled mode. |
| Verify that select boxes are working | 1. Click on one select box. | The select box should show a check sign. |
| Verify that the “select all” box is working | 1. Click on the “select all” box. | Select boxes of every row should show a check sign. |
| Verify that the system could change asset importance rating using stars | 1. Hover the cursor above the stars of one asset.  2. Click cursor on one star.  3. Repeat step 1-2 on other assets if needed.  3. Click “Submit” button. | A message box should be popped up with alert message “Asset data updated successfully!”  The asset table should be reloaded; the asset importance of the modified asset(s) should be set to new star value. |
| Verify that the system could change asset importance using bulk edit | 1. Check the select box of one or more asset(s).  2. Change the value of bulk edit [suppose to 2].  3. Click “Submit” button. | A message box should be popped up with alert message “Asset data updated successfully!”  The asset table should be reloaded; the asset importance of the selected asset(s) should be set to 1. |
| Verify that “Cancel” button could discard the changes made | 1. Change asset rating by either star or bulk edit.  2. Click “Cancel” button. | The asset table should be reloaded; the changes made should not be saved. |

### 3. Test suite for Reports page functionalities

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected Result** |
| Verify that the system could export the report as a csv file | 1. Click “CSV” button. | A file named “export.csv” should be created and downloaded; the content of the file should be the data of the report table. |
| Verify that the system could export the report as a json file | 1. Click “JSON” button | A file named “export\_as\_json.json” should be created and downloaded; the content of the file should be the data of the report table. |
| Verify that the system could update report table when uploading a new file | 1. Click “Browse”.  2. In the popped up explorer, select a valid csv file.  3. Click “Upload”. | The report table should be reloaded; the content of the table should be updated to the data of the new input file; earlier entry of the table should be deleted. |
| Verify that the report table could be sorted | 1. Click any header column of report table. | The data in the table should be displayed in sorted order based on the column clicked. |

### 4. Test suite for Dashboard page functionalities

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected Result** |
| Verify that the pie chart could be correctly shown | 1. Click “Dashboard” tab. | Pie chart should be shown with color. |
| Verify that the pie chart correctly show the distribution of business risk report data | 1. Click “Assets” tab and go to Assets page.  2. Select all asset and use bulk edit to change all importance ratings to 1.  3. Click “Submit”.  4. Click “Dashboard” tab to go to Dashboard page. | The distribution of “low” should be dramatically increased; the blue part of the pie chart should grow large (even take up the whole pie). |
| Verify that the slider of “Modify Business Risk Formula” works properly | 1. Click the pointer of the slider.  2. Drag it to the left.  3. Drag it to the right. | The distribution in pie chart should change accordingly. When the pointer moves, business risk should change.  If the pointer goes to the far left (asset importance rating is not taken into consideration when calculating business risk), business risk value of every vulnerability in Reports page is equal to its severity.  If the pointer goes to far right (severity is not taken into consideration when calculating business risk), business risk value of every vulnerability should be equal to the asset importance of its IP.  The value of “Asset Rating Component” and “Severity Rating Component” should be changed accordingly. |
| Verify that the slider of “Modify distribution range” works properly | 1. Click the left pointer of the slider.  2. Drag it to the left.  3. Drag it to the right. | The distribution in pie chart should change accordingly. When the left pointer goes left, distribution of “low” should decrease. When the right pointer goes right, distribution of “high” should decrease.  The value in the legend of the pie chart should be changed accordingly. |

### 5. Test suite for User Settings page functionalities and user authentication

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected Result** |
| Verify that admin user could view all tables and charts, download the reports, update asset importance rating, and upload CSV | 1. Login as admin.  2. Click on “Dashboard” tab to go to Dashboard page.  3. Move sliders and check the result on pie chart.  4. Click on “Reports” tab to go to Reports page.  5. Select and upload files to update the table.  6. Click both “CSV” and “JSON” to export the table.  7. Click on “Assets” tab to go to Assets page.  8. Update asset importance rating by either bulk editing or changing star rating. | Admin user should be able to view all pages and tables.  In “Dashboard” page, admin user should be able to modify distribution by using the slider.  In “Reports” page, admin user should be able to upload new csv file to update the data, and export and download the data as csv or json.  In “Assets” page, admin user should be able to update asset importance rating. |
| Verify that admin user could view and upgrade other users | 1. Login as admin.  2. Click on “User Settings” tab to go to User Settings page.  3. Click the check sign in column “APPROVE AS ADMIN” or “APPROVE AS NONADMIN”. | The user account should be upgraded to admin or non-admin. |
| Verify that admin user could delete users | 1. Login as admin.  2. Click on “User Settings” tab to go to User Settings page.  3. Click the deletion sign in column “DELETE USER”. | The use account should be deleted. |
| Verify that non-admin user could view all tables and charts, and download the reports, but cannot view and upgrade other users, update asset importance rating, or upload CSV | 1. Login as non-admin.  2. Click on “Dashboard” tab to go to Dashboard page.  3. Move sliders and check the result on pie chart.  4. Click on “Reports” tab to go to Reports page.  5. Click both “CSV” and “JSON” to export the table.  6. Click on “Assets” tab to go to Assets page. | Non-admin user should be able to view “Dashboard”, “Reports”, and “Assets” pages, and not be able to view “User Setting” page.  In “Dashboard” page, non-admin user should be able to modify distribution by using the slider.  In “Reports” page, admin user should not be able to see “Browse” and “Upload” buttons; should be able to download the data as csv or json.  In “Assets” page, non-admin user should not be able to see the “Submit” and “Cancel” button. |
| Verify that user that registered but not approved cannot login, view all tables and charts, download the reports, view and upgrade other users, update asset importance rating, or upload CSV | 1. Login with a registered but not approved account.  2. Add “/inventory” or “/table” in the url of the system in browser and press “Enter” key on keyboard to access. | When the user that registered but not approved trying to login, the system should show error message “This account is inactive.”  When the user that registered but not approved trying to access the pages of the system using url, he/she should always be redirected to login page. |
| Verify that anonymous user cannot login, view all tables and charts, download the reports, view and upgrade other users, update asset importance rating, or upload CSV | 1. Add “/inventory” in the url of the system in browser and press “Enter” key on keyboard to access. | The anonymous user should always be redirected to login page. |

### 6. Test suite for User Registration

|  |  |  |
| --- | --- | --- |
| **Scenario** | **Test Step** | **Expected Result** |
| Verify that user could register a new account with valid user name (not duplicated) and valid password (8 or more character long, must contain at lease one lower case letter, one upper case letter, one number, and one special character) | 1. Click link “Don’t have an account?” in “Login” page to go to registration page.  2. In “Signup” form, input valid user name, valid password, and other fields.  3. Click “Register”. | A success message should be shown in green color with content as “Congratulations! You are successfully registered. Please wait for the admin to approve you.” |
| Verify that the system does not accept duplicated user name | 1. Register an account with name “test”.  2. Register a new account with name “test”. | An error message should be shown in red color with content “Error during Registration” |
| Verify that the system does not accept invalid password (standard for valid: 8 or more character long, must contain at lease one lower case letter, one upper case letter, one number, and one special character) | 1. In “Signup” form, input invalid password as [examples include “”, “testing”, “testinga”, “testing123”, “testing123!”, “TESTING123!”].  2. Click “Register”. | An error message should be shown in red color with content “Password must be at least 8 characters long and should contain at least one upper case, one lowercase, one special character and one number”. |