Standalone applications testing and automation

Desktop QA team
Red Hat, Inc.

2014-02-02

Who we are

Red Hat's Desktop QE team

Quality assurance for:

- Desktop hardware
  - Wireless, graphics, audio...
- Desktop application stack
  - Desktop environments
  - GUI management tools
  - Office applications

Distributions under test

RHEL7.0 Desktop

RHEL 5-6 updates

Fedora Rawhide/RHEL next

Latest versions testing:

- NetworkManager
- Evolution

Distributions under test

- RHEL7.0 Desktop
- RHEL 5-6 updates
- Fedora Rawhide/RHEL next
- Latest versions testing:
  - NetworkManager
  - Evolution

Distributions under test

- RHEL7.0 Desktop
- RHEL 5-6 updates
- Fedora Rawhide/RHEL next
- Latest versions testing:
  - NetworkManager
  - Evolution

Distributions under test

RHEL7.0 Desktop

RHEL 5-6 updates

Fedora Rawhide/RHEL next

Latest versions testing:

- NetworkManager
- Evolution

Infrastructure bits

Beaker manages available machines and distributions

Simple Test Harness task fetches test automation code and runs required tests

Behave controls automation execution

Dogtail/pexpect executes actions on UI/CLI

Code review in **Gerrit**

Test case management - **Nitrate**

Infrastructure bits

Beaker manages available machines from the pool and distributions

Simple Test Harness task fetches test automation code and runs required tests

Behave controls automation execution

Dogtail/pexpect executes actions on UI/CLI

Code review in **Gerrit**

Test case management - **Nitrate**

Infrastructure bits

Beaker manages available machines from the pool and distributions

Simple Test Harness task fetches test automation code and runs required tests

Behave controls automation execution

Dogtail/pexpect executes actions on UI/CLI

Code review in **Gerrit**

Test case management - **Nitrate**

Infrastructure bits

Beaker manages available machines from the pool and distributions

Simple Test Harness task fetches test automation code and runs required tests

Behave controls automation execution

Dogtail/pexpect executes actions on UI/CLI

Code review in **Gerrit**

Test case management - **Nitrate**

Infrastructure bits

Beaker manages available machines from the pool and distributions

Simple Test Harness task fetches test automation code and runs required tests

Behave controls automation execution

Dogtail/pexpect executes actions on UI/CLI

Code review in **Gerrit**

Test case management - **Nitrate**

Beaker

http://beaker-project.org

Automation and task execution system for labs of test computers

VM / bare-metal machines support

Multiarchitecure support

Flexible permissions system

Beaker

Most notable tasks used:

- /desktop/rhel7/install
  - Installs the desktop components (GNOME/KDE)
- /desktop/simpletestharness
  - fetches automation code from git/gzip sources
  - starts specified tests to be executed
  - stores test output, reports and artifacts

Beaker

Most notable tasks used:

- /desktop/rhel7/install
  - Installs the desktop components (GNOME/KDE)
- /desktop/simpletestharness
  - fetches automation code from git/gzip sources
  - starts specified tests to be executed
  - stores test output, reports and artifacts

Dogtail

Python GUI automation framework taking advantage of Accessibility technologies

Based on AT-SPI – toolkit-neutral technology, used by GTK, Qt, Mozilla, LibreOffice

Dogtail

Dogtail-based upstream test suites

- PiTiVi
- GNOME Software
- Evince

Sniff

Sniff is a GUI for AT-SPI structure

Scripts and unittests

Scripts -> Unittests -> BDD

BDD – Behaviour Driven Development

Gherkin

Gherkin – Business Readable Domain Specific Language

Test scenarios are human-readable list of steps to be performed

Steps are matched to python procedures, called **step definitions**

Gherkin

Core keywords: Feature, Background, Scenario

Scenarios can be grouped by feature or using tags

Behave

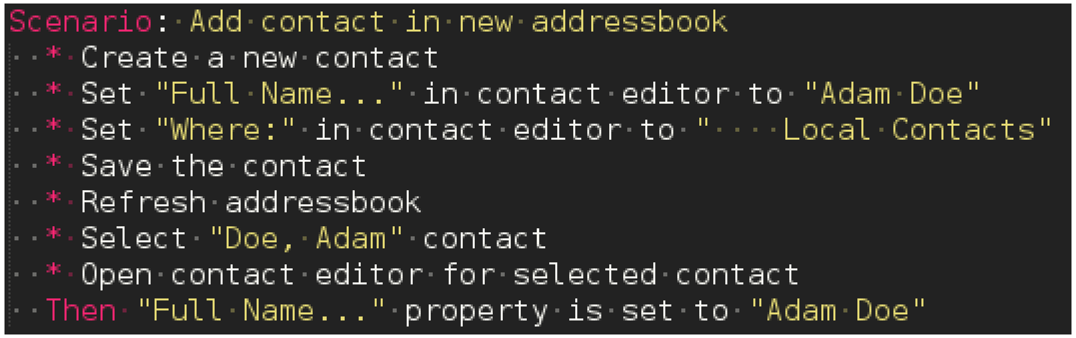
https://pypi.python.org/pypi/behave

Python implementation of BDD approach

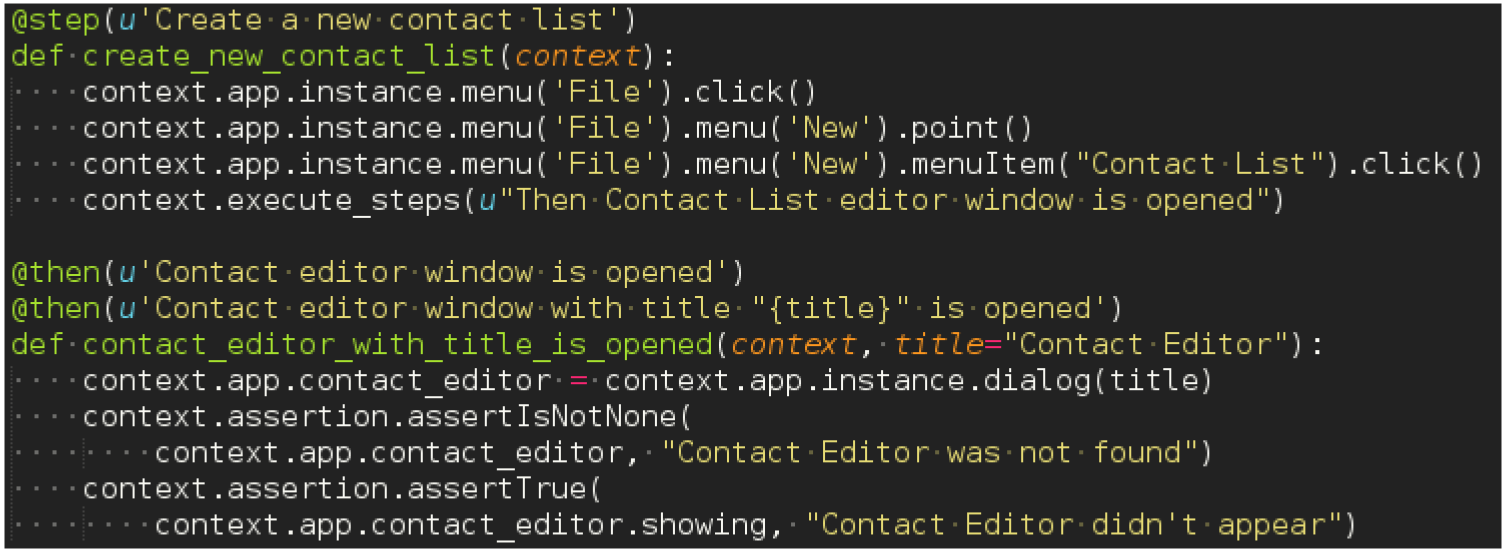
Flexible output formatters (HTML, plain etc.)

Setup / breakdown is implemented via before_* / after_* procedures

Behave



```
Scenario: Add contact in new addressbook
  * Create a new contact
  * Set "Full Name..." in contact editor to "Adam Doe"
  * Set "Where:" in contact editor to "    Local Contacts"
  * Save the contact
  * Refresh addressbook
  * Select "Doe, Adam" contact
  * Open contact editor for selected contact
  Then "Full Name..." property is set to "Adam Doe"
```



```
@step(u'Create a new contact list')
def create_new_contact_list(context):
    context.app.instance.menu('File').click()
    context.app.instance.menu('File').menu('New').point()
    context.app.instance.menu('File').menu('New').menuItem("Contact List").click()
    context.execute_steps(u"Then Contact List editor window is opened")

@then(u'Contact editor window is opened')
@then(u'Contact editor window with title "{title}" is opened')
def contact_editor_with_title_is_opened(context, title="Contact Editor"):
    context.app.contact_editor = context.app.instance.dialog(title)
    context.assertion.assertIsNotNone(
        context.app.contact_editor, "Contact Editor was not found")
    context.assertion.assertTrue(
        context.app.contact_editor.showing, "Contact Editor didn't appear")
```

Tips and Tricks

HTML report with screenshots after each step and logs from journalctl

Screencast recording

Detect app crashes via abrt

Benefits of BDD approach

- Automated test scenarios are human-readable
  - Can be used as a instructions for manual tests
  - Easy to update / enhance
- Scenarios can be written by designers
  - draft new features
  - document app behaviour
- Steps can be reused across several projects:
  - Gnome Online Accounts handling
  - Working with GNOME open / save file dialogs

Benefits of BDD approach

- Automated test scenarios are human-readable
  - Can be used as a instructions for manual tests
  - Easy to update / enhance
- Scenarios can be written by designers
  - draft new features
  - document app behaviour
- Steps can be reused across several projects:
  - Gnome Online Accounts handling
  - Working with GNOME open / save file dialogs

Benefits of BDD approach

- Automated test scenarios are human-readable
  - Can be used as a instructions for manual tests
  - Easy to update / enhance
- Scenarios can be written by designers
  - draft new features
  - document app behaviour
- Steps can be reused across several projects:
  - Gnome Online Accounts handling
  - Working with GNOME open / save file dialogs

Benefits of BDD approach

UI abstraction in scenarios:

- Same scenarios can be used to test various frontends: e.g. NetworkManager's nmcli / nmtui
- Evolution tests with minimal adjustments can be used for RHEL 6, RHEL 7, Fedora 20 and Fedora Rawhide

Due to grouping scenarios by feature we can easily run regression check for affected feature

Benefits of BDD approach

UI abstraction in scenarios:

- Same scenarios can be used to test various frontends: e.g. NetworkManager's nmcli / nmtui
- Evolution tests with minimal adjustments can be used for RHEL 6, RHEL 7, Fedora 20 and Fedora Rawhide

Due to grouping scenarios by feature we can easily run regression check for affected feature

Success stories: NM, Evolution

Evolution testing across available distributions

Proposed patch testing

Network Manager

- Uses pexpect instead of dogtail
- Scenarios can be re-used to test various NM frontends: nmcli, nmtui (ncurses-based)
- Sharing steps with GNOME Control Center

Success stories: NM, Evolution

- Evolution testing across available distributions
- Proposed patch testing
- Network Manager
  - Uses pexpect instead of dogtail
  - Scenarios can be re-used to test various NM frontends: nmcli, nmtui (ncurses-based)
  - Sharing steps with GNOME Control Center

Future plans

Working with Fedora QA to have a similar process for Fedora

Execute tests directly in upstream CI:

- GNOME-continuous
- Build.kde.org

Future plans

Working with Fedora QA to have a similar process for Fedora

Execute tests directly in upstream CI:

- GNOME-continuous
- Build.kde.org

Questions