

THE BEST TESTING TOOLS WE'VE EVER HAD

An introduction to

OPENQA FOR GNOME

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MY STORY

- GNOME (2003-)
- Codethink (2011-)
- Desktop search (Tracker) (2011-)

In 2011, GNOME had no automated testing *at all*

DREAMS OF END TO END TESTING

- **GUADEC 2012** in A Coruña:
 - GNOME Continuous; "Testable" initiative
- **GNOME OS** project:
 - BuildStream, Freedesktop SDK
- openQA at **SUSE**: since 2009
 - Now used by Fedora, Debian, and more
- **Codethink**: openQA testing in automotive

Open this URL in your laptop:

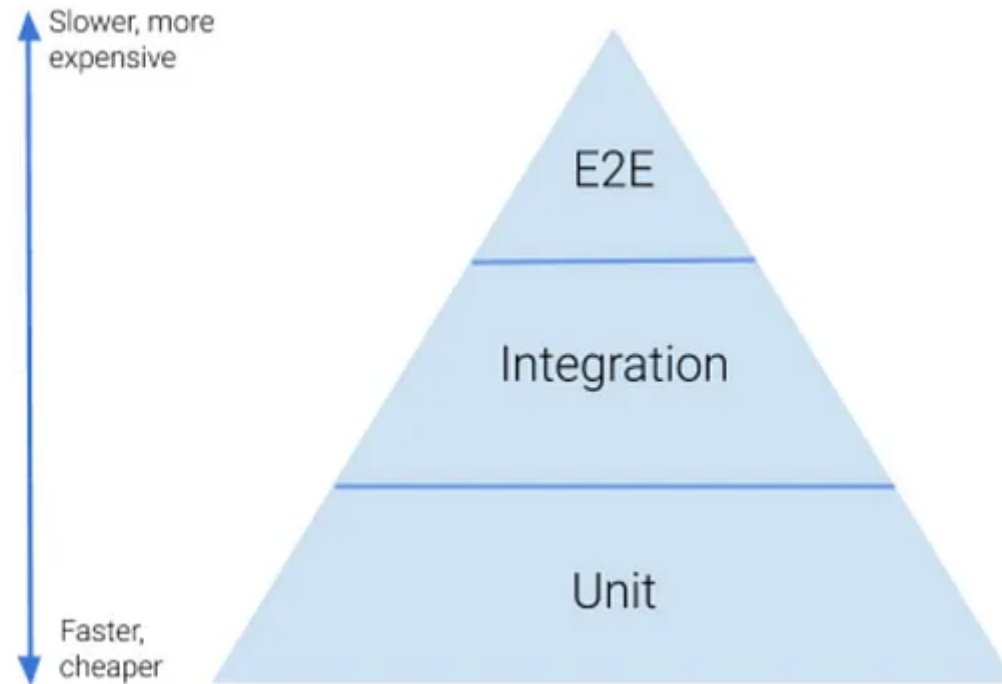
<https://openqa.gnome.org/>






END TO END TESTING FOR GNOME

- Each testsuite runs in a new virtual machine
- Tests run against [GNOME OS](#):
 - Latest commit of every GNOME module
 - [Freedesktop SDK](#) base OS
- Working since Sept. 2022, in "open beta" status

TYPES OF TESTING



USE CASES

1. See "latest GNOME" 
2. Update needles 
3. Diagnose & report regressions 
4. Develop new tests: 

HOW TO: SEE "LATEST GNOME"







Documentation: [Checking test results](#)

COMPONENTS OF GNOME OPENQA TESTING

1. **openQA**: optional web frontend (openqa.gnome.org)
2. **isotovideo**: openQA test runner (you can run this on your laptop!)
3. **gnome-build-meta**: integration repo
 - project CI builds GNOME OS and runs openQA tests
4. **openqa-tests**: tests repo
 - Defines test suites (using Perl + [openQA test API](#))
5. **openqa-needles**: screenshots repo

USE CASES

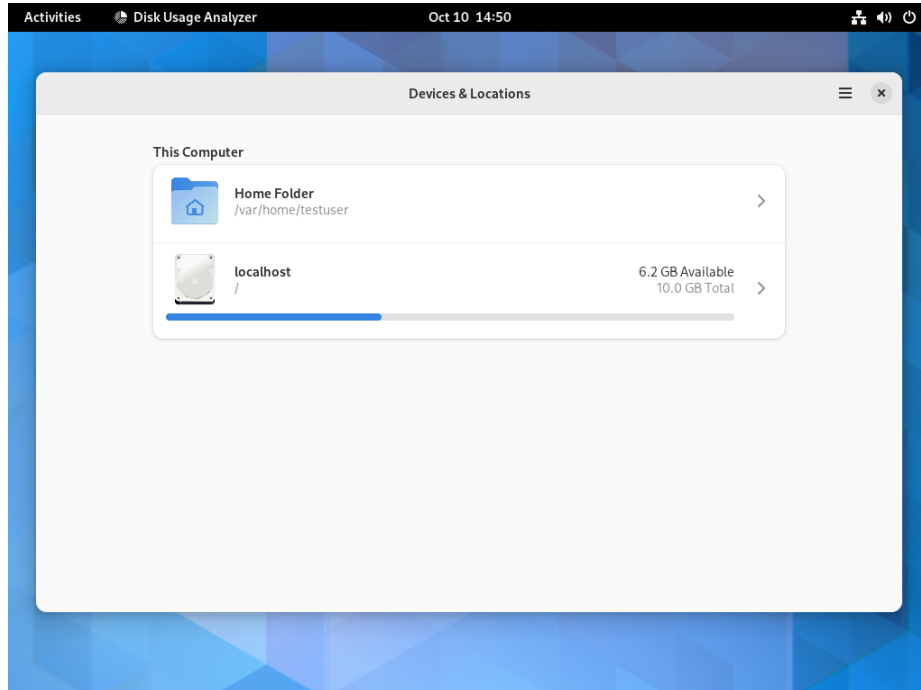
1. See "latest GNOME" 
2. **Update needles** 
3. Diagnose & report regressions 
4. Develop new tests: 

HOW TO: UPDATE A NEEDLE



Documentation: [How to update a needle](#)

AN EXAMPLE NEEDLE



```
{  
  "area": [  
    {  
      "xpos": 31,  
      "ypos": 78,  
      "width": 959,  
      "height": 599,  
      "type": "match",  
      "match": 96,  
    }  
  ],  
  "properties": [],  
  "tags": [  
    "app_baobab_home"  
  ]  
}
```

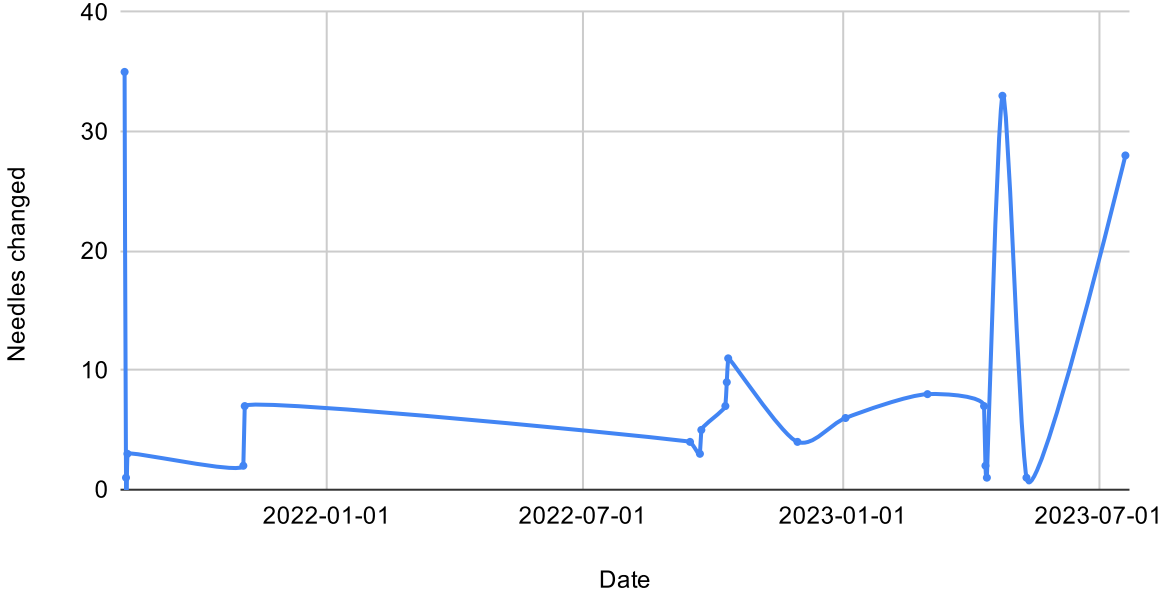
See this needle in action [here](#).

See also: [openQA starter guide - Basic Concepts](#).

Question: "How many false positives do you get?"

Look at how often the needles are updated...

Needles changed vs Date



Screenshot tests will always have false positives.

openQA deals with this in 4 ways:

1. Search within the screen
2. Similarity threshold (90-100%)
3. Exclude zones
4. Web UI for needle updates.

USE CASES

1. See "latest GNOME" 
2. Update needles 
3. **Diagnose & report regressions** 
4. Develop new tests: 

HOW TO: DIAGNOSE & REPORT REGRESSIONS






Documentation: [When tests fail](#)

Question: *"how many real bugs has openQA caught?"*

Let's see Gitlab label: [g. End-to-end test failure](#)

USE CASES

1. See "latest GNOME" 
2. Update needles 
3. Diagnose & report regressions 
4. **Develop new tests:** 

HOW TO: DEVELOP NEW TESTS



Documentation: [Adding more tests](#)

HOW YOUR TEST CONTROLS THE VM

1) Trigger an action:

- Type on keyboard - `send_key`, `type_string`
- Click with mouse - `mouse_set`, `assert_and_click`
- Run command on serial console - `assert_script_run`
- Other stuff: `power`, `switch_network`, ...

2) Assert that the correct thing happened

- Await needle (screenshot) match - `assert_screen`
- Other stuff - `upload_asset`, `assert_recorded_sound`, ...

Example: `app_nautilus.pm`

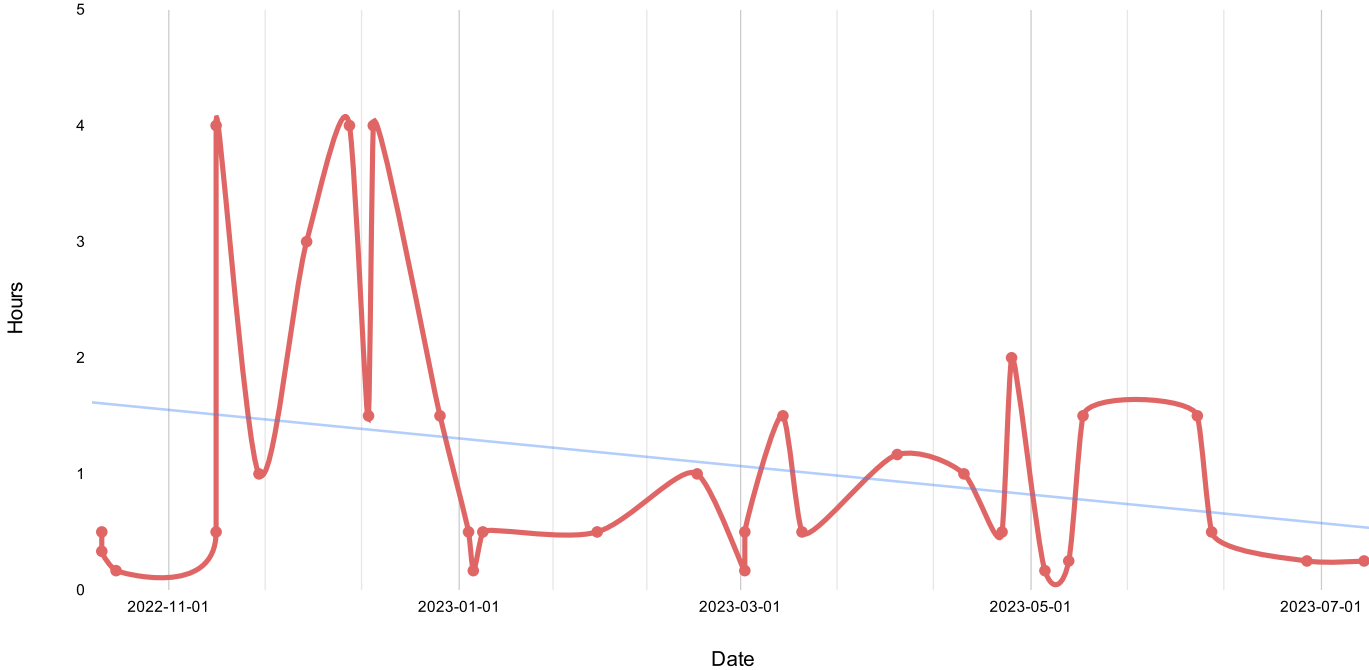
RUNNING TESTS LOCALLY

Documentation: [Running the test suite locally](#)

Helper tool: [ssam_openqa](#)

Question: *How much effort is it to maintain?*

Hours spent on openQA maintenance



Source: <https://gitlab.gnome.org/GNOME/openqa-tests/-/issues/9>

WHAT'S NEXT?

It's up to you! Any of these things may or may not happen...

- Tests for core app features, [Shell](#), [locales](#), [accessibility](#), [search + content apps](#)
- [Pre-merge testing](#) for gnome-build-meta
- Tests on real hardware and performance measurement
- Tests for [specific GNOME releases](#)
- [Testing beyond gnome-build-meta](#) (e.g. 3rd party apps)
- A culture of end-to-end testing and higher quality releases.

HOW TO GET INVOLVED

Help welcome from GNOME maintainers and **everyone else!**

I will provide training on infra maintenance and writing tests - just ask.

- Chat: Matrix [#gnome-os:gnome.org](#)
- Forum: <https://discourse.gnome.org/>
- Email: sam@afuera.me.uk

Also: [documentation](#), [issue tracker](#)

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