AutoQA introduction
less manual testing for Fedora

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AutoQA origins

how it all started

AutoQA origins

There is a lot of stuff that Fedora QA team needs to test to ensure best user experience:

- install media

- anaconda installer

- basic desktop environment

- software (application/library) updates

- RPM package validity

- YUM repository validity

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AutoQA origins

Unfortunately we would need to grow much more hands and heads to be able to tackle all of that. And still...

So let's be lazy – let's have a computer do that! We just need to write the proper software, that's all.

And then we can just sit and watch!

(Have you heard that the main motivator for most software projects is programmers' laziness? Now you know.)

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AutoQA origins

A software called AutoQA.

Meaning automated QA taking care of everything needed. Meaning artificially-intelligent state-of-the-art Skynet-like system solving all our needs (morning coffee included).

Well, we're not there yet.

But we're closing.

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Current state of AutoQA

Current state of AutoQA

- heavy development (surprise surprise!)

- packages available for Fedora and EPEL (in a third-party repository)

- documentation available, not always up-to-date

- results just sent to mailing list and (optionally) to package maintainers for now, database with API being prepared

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Current state of AutoQA

- working tests that check:
  - anaconda installer
  - software updates
  - RPM package validity
  - YUM repository validity

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Current state of AutoQA

AutoQA tests

AutoQA tests

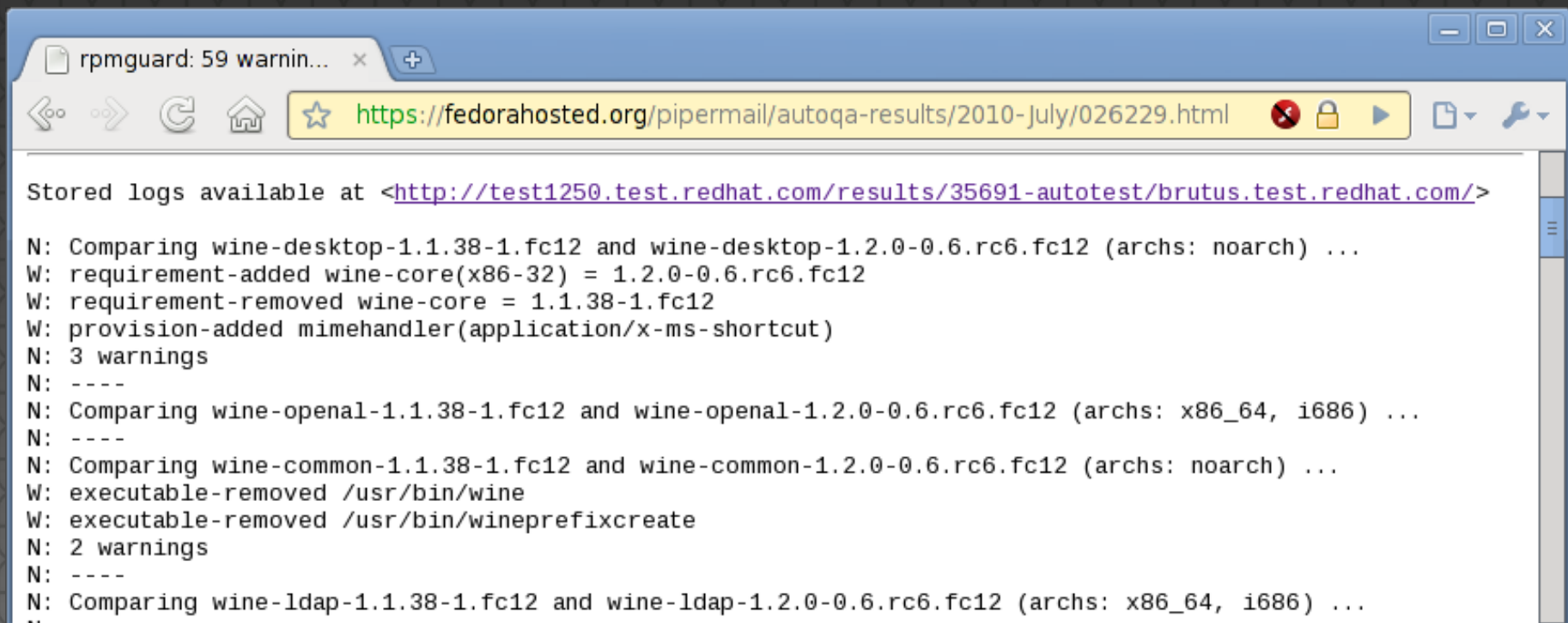Rpmlint - checks RPM package for common mistakes and packaging guidelines conformance using rpmlint tool

AutoQA tests

Rpmguard - compares older package build available in some stable repository with the new build and prints interesting differences


```
rpmguard: 59 warnin...   ×

https://fedorahosted.org/pipermail/autoqa-results/2010-July/026229.html

Stored logs available at <http://test1250.test.redhat.com/results/35691-autotest/brutus.test.redhat.com/>

N: Comparing wine-desktop-1.1.38-1.fc12 and wine-desktop-1.2.0-0.6.rc6.fc12 (archs: noarch) ...
W: requirement-added wine-core(x86-32) = 1.2.0-0.6.rc6.fc12
W: requirement-removed wine-core = 1.1.38-1.fc12
W: provision-added mimehandler(application/x-ms-shortcut)
N: 3 warnings
N: ----
N: Comparing wine-openal-1.1.38-1.fc12 and wine-openal-1.2.0-0.6.rc6.fc12 (archs: x86_64, i686) ...
N: ----
N: Comparing wine-common-1.1.38-1.fc12 and wine-common-1.2.0-0.6.rc6.fc12 (archs: noarch) ...
W: executable-removed /usr/bin/wine
W: executable-removed /usr/bin/wineprefixcreate
N: 2 warnings
N: ----
N: Comparing wine-ldap-1.1.38-1.fc12 and wine-ldap-1.2.0-0.6.rc6.fc12 (archs: x86_64, i686) ...
```

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AutoQA tests

Initscripts - performs LSB-compliance checks on packages containing initscripts

- only some are supported, but we are constantly adding support for more
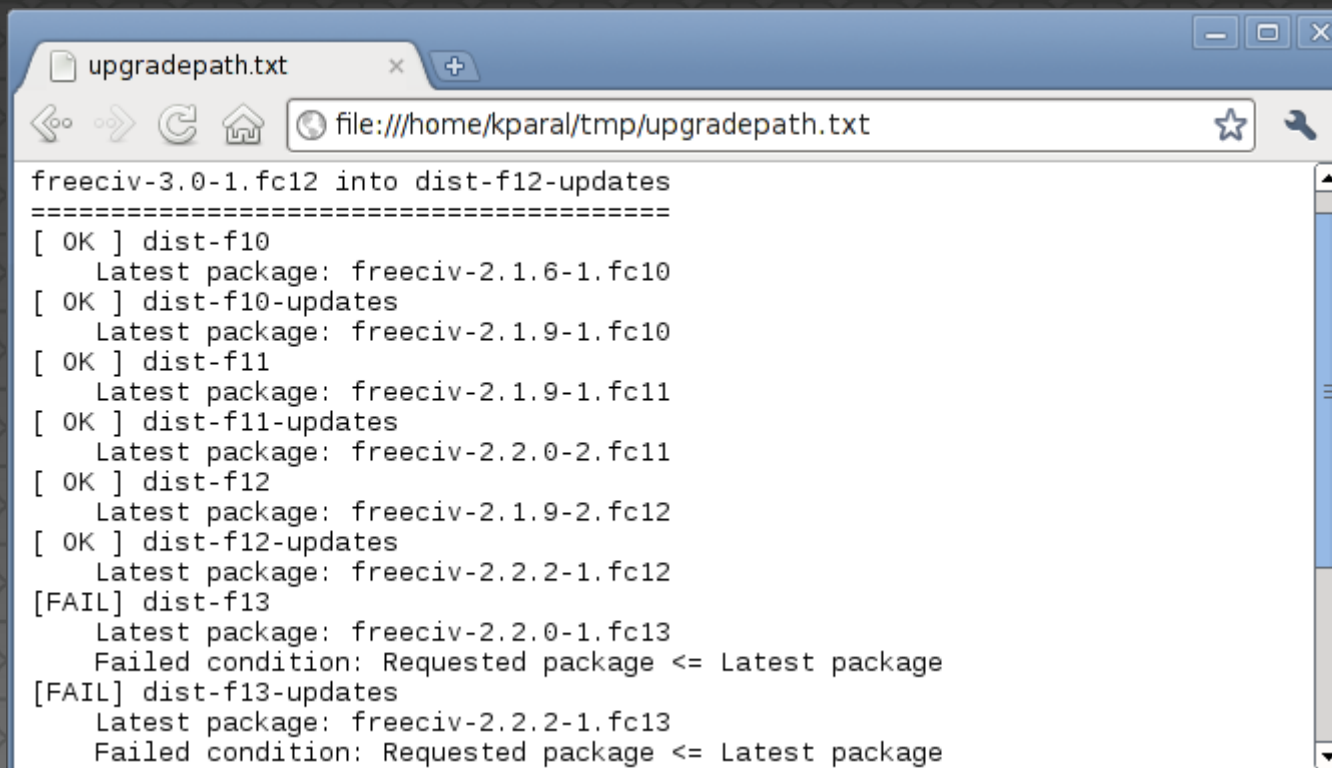
```
initscripts: 1 PASSED, ...

https://fedorahosted.org/pipermail/autoqa-results/2010-August/0

:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
:: [   LOG    ] :: Start
:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::

:: [   PASS   ] :: Running 'service sshd start'
:: [   PASS   ] :: Running 'service sshd status'
:: [   PASS   ] :: Running 'service sshd start'
:: [   PASS   ] :: Running 'service sshd status'
:: [   PASS   ] :: Running 'service sshd restart'
:: [   PASS   ] :: Running 'service sshd status'
:: [   LOG    ] :: Duration: 1s
:: [   LOG    ] :: Assertions: 6 good, 0 bad
:: [   PASS   ] :: RESULT: Start
```

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AutoQA tests
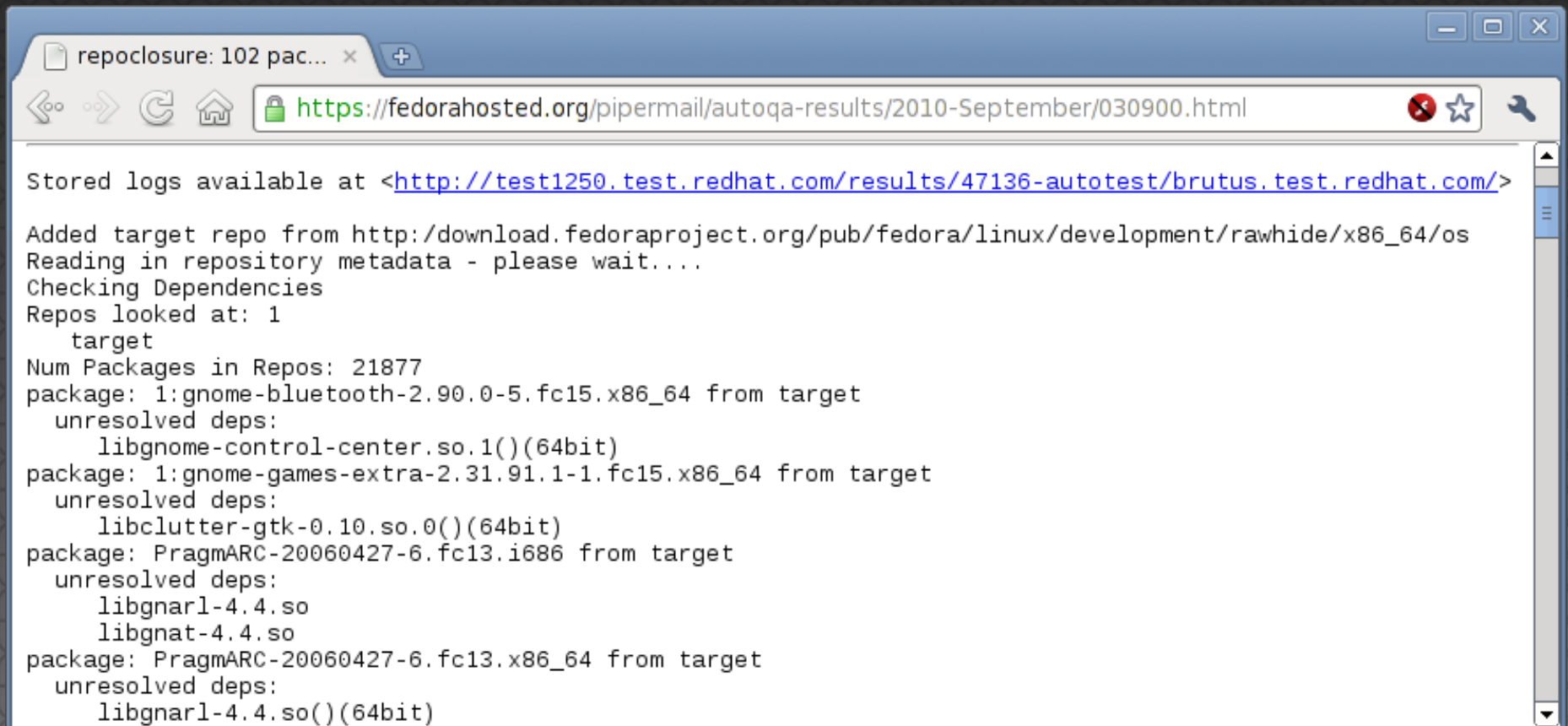
Upgradepath - checks whether it is ok to push some package build to a selected repository and not break the ability to do "yum upgrade" afterwards

```
upgradepath.txt                    ×    ✛

  file:///home/kparal/tmp/upgradepath.txt              ☆   🔧

freeciv-3.0-1.fc12 into dist-f12-updates
=========================================
[ OK ] dist-f10
       Latest package: freeciv-2.1.6-1.fc10
[ OK ] dist-f10-updates
       Latest package: freeciv-2.1.9-1.fc10
[ OK ] dist-f11
       Latest package: freeciv-2.1.9-1.fc11
[ OK ] dist-f11-updates
       Latest package: freeciv-2.2.0-2.fc11
[ OK ] dist-f12
       Latest package: freeciv-2.1.9-2.fc12
[ OK ] dist-f12-updates
       Latest package: freeciv-2.2.2-1.fc12
[FAIL] dist-f13
       Latest package: freeciv-2.2.0-1.fc13
       Failed condition: Requested package <= Latest package
[FAIL] dist-f13-updates
       Latest package: freeciv-2.2.2-1.fc13
       Failed condition: Requested package <= Latest package
```

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AutoQA tests

Repoclosure - checks for broken package dependencies in YUM repositories
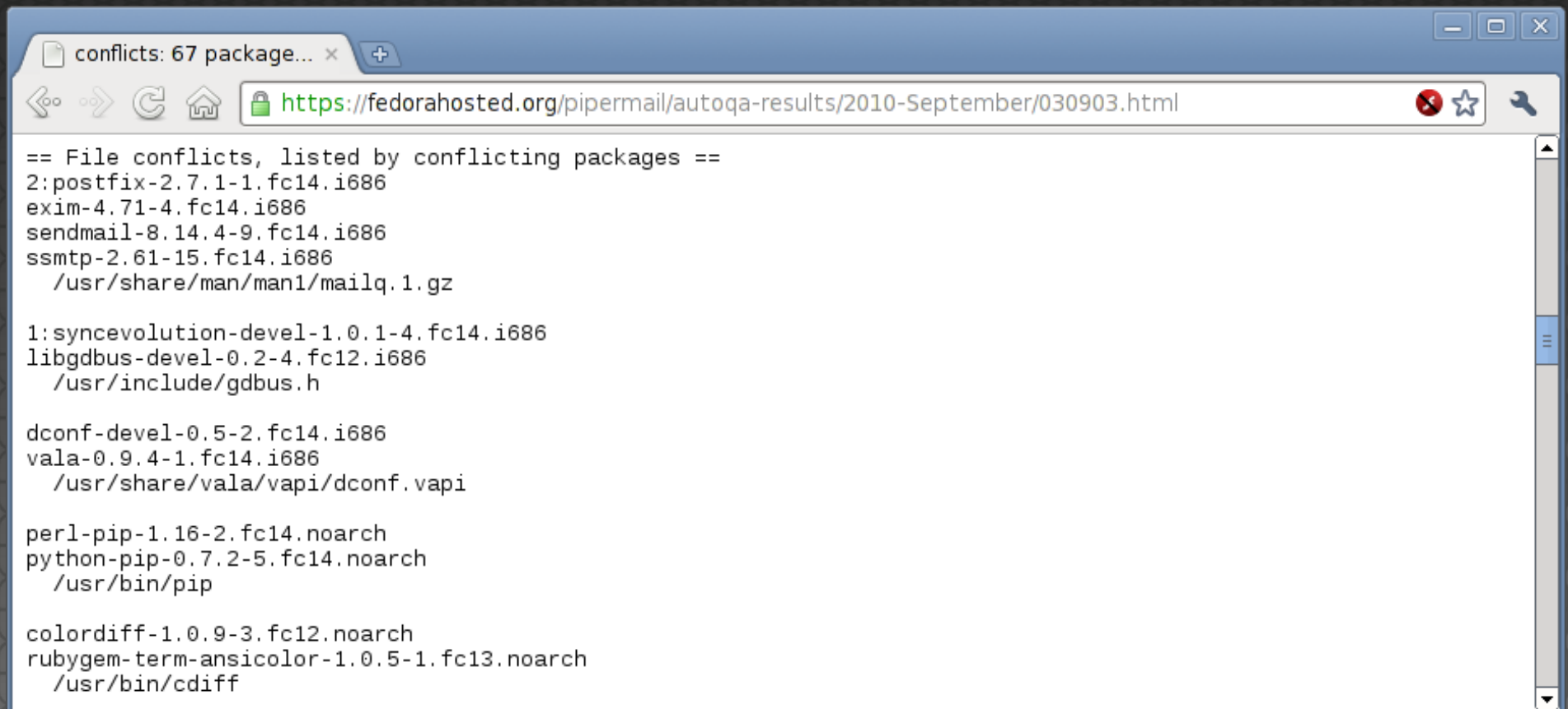

```
repoclosure: 102 pac...    ✕    ✛

🔒 https://fedorahosted.org/pipermail/autoqa-results/2010-September/030900.html

Stored logs available at <http://test1250.test.redhat.com/results/47136-autotest/brutus.test.redhat.com/>

Added target repo from http:/download.fedoraproject.org/pub/fedora/linux/development/rawhide/x86_64/os
Reading in repository metadata - please wait....
Checking Dependencies
Repos looked at: 1
   target
Num Packages in Repos: 21877
package: 1:gnome-bluetooth-2.90.0-5.fc15.x86_64 from target
   unresolved deps:
      libgnome-control-center.so.1()(64bit)
package: 1:gnome-games-extra-2.31.91.1-1.fc15.x86_64 from target
   unresolved deps:
      libclutter-gtk-0.10.so.0()(64bit)
package: PragmARC-20060427-6.fc13.i686 from target
   unresolved deps:
      libgnarl-4.4.so
      libgnat-4.4.so
package: PragmARC-20060427-6.fc13.x86_64 from target
   unresolved deps:
      libgnarl-4.4.so()(64bit)
```

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AutoQA tests

Conflicts - checks for package and file conflicts in YUM repositories

```
conflicts: 67 package...  ×  +

https://fedorahosted.org/pipermail/autoqa-results/2010-September/030903.html

== File conflicts, listed by conflicting packages ==
2:postfix-2.7.1-1.fc14.i686
exim-4.71-4.fc14.i686
sendmail-8.14.4-9.fc14.i686
ssmtp-2.61-15.fc14.i686
   /usr/share/man/man1/mailq.1.gz

1:syncevolution-devel-1.0.1-4.fc14.i686
libgdbus-devel-0.2-4.fc12.i686
   /usr/include/gdbus.h

dconf-devel-0.5-2.fc14.i686
vala-0.9.4-1.fc14.i686
   /usr/share/vala/vapi/dconf.vapi

perl-pip-1.16-2.fc14.noarch
python-pip-0.7.2-5.fc14.noarch
   /usr/bin/pip

colordiff-1.0.9-3.fc12.noarch
rubygem-term-ansicolor-1.0.5-1.fc13.noarch
   /usr/bin/cdiff
```
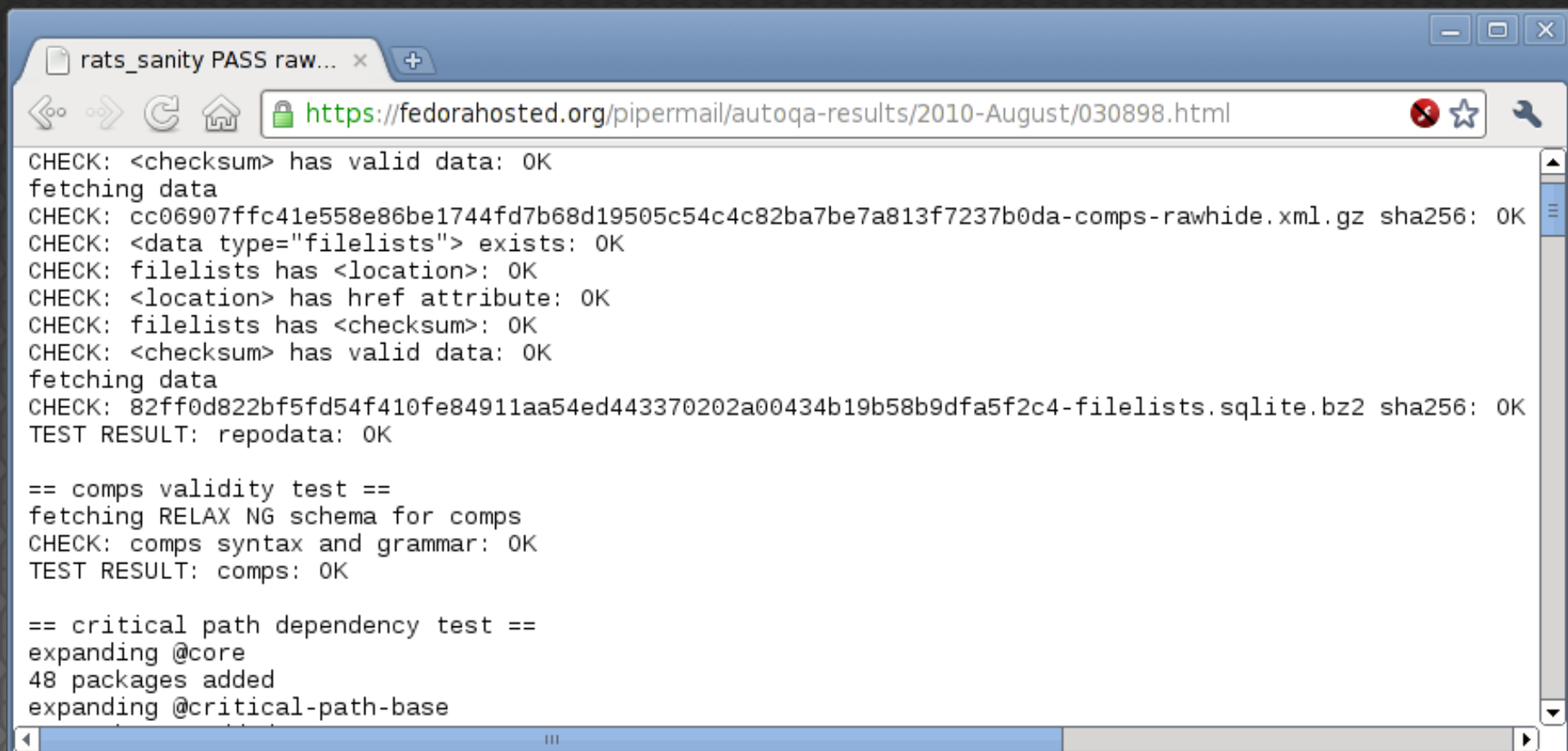
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AutoQA tests

Rats_sanity - checks whether Rawhide compose is available and complete

AutoQA tests

Rats_install - performs an automated anaconda installation of a Rawhide compose


```
rats_install PASS raw...    ×    ⊕

◁◦ ◦▷ C ⌂    🔒 https://fedorahosted.org/pipermail/autoqa-results/2010-July/028960.htm ⊗ ☆    🔧

== kernel boot test ==
opening serial console
  serial console at /dev/pts/0
polling for boot messages
kernel version 2.6.35-0.55.rc6.git0.fc14.x86_64 booted, initrd started OK
TEST RESULT: kernel_boot: OK

== anaconda loading stage2 test ==
polling for stage2 startup message
anaconda 14.12 stage2 has started
TEST RESULT: load_stage2: OK

== anaconda disk probe test ==
Starting minimon log monitor on port 60991
  anaconda now in step setuptime
  anaconda now in step autopartitionexecute
  anaconda now in step storagedone
  anaconda now in step enablefilesystems
storage setup completed OK
TEST RESULT: diskprobe: OK

== anaconda package installation test ==
Waiting up to 20 minutes for package installation to complete
  anaconda now in step bootloadersetup
```

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AutoQA tests

- and some more tests being written...

  - Package sanity - tests whether a new package build can be installed, upgraded, downgraded, removed, etc

  - Depcheck - complex test whether new package build will break something in a YUM repository or not

  - Anaconda - testing anaconda installation using standard DVD media

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AutoQA usage

Envisioned usage...

- execute tests upon main Fedora test events
  - package updates, repo updates, new Fedora milestones/releases
  - warning relevant people or even blocking actions when something goes wrong

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Envisioned usage...

- provide service for third-parties
  - Koji showing you test results after each new package build
  - Bodhi showing you test results for every proposed package update

Package Acceptance Dashboard

« autofs-5.0.5-23.fc14 »	i386	x86_64
Package sanity	✅ autoqa	✅ autoqa
Depcheck	⛔ autoqa	⛔ autoqa
File conflicts	⏳ autoqa	⚠️ autoqa
Upgrade path	⏳ autoqa	✅ jkeating
rpmlint regressions	✅ autoqa	⚠️ kparal

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Envisioned usage...

- schedule custom tests as required
  - "Hey, what about testing feature xyz for all Fedora packages, right now?"
- accept new tests covering different software aspects from contributors
  - thus making AutoQA better and better and better...

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AutoQA benefits

a.k.a. "What's in it for you?"

AutoQA benefits

- **Package maintainers**: a whole range of tests executed on any new build or update proposal; fast notice if something's wrong or suspicious

- **Release engineers**: much harder to break repo, tests specifically designed to prevent that

- **Developers**: some tests designed to inform about general software flaws (LSB compliance, etc)

- **Users**: more reliable updates (do I have to say anything more?)

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Hacking AutoQA

Hacking AutoQA

A little bit of architecture:

https://fedoraproject.org/wiki/AutoQA_architecture
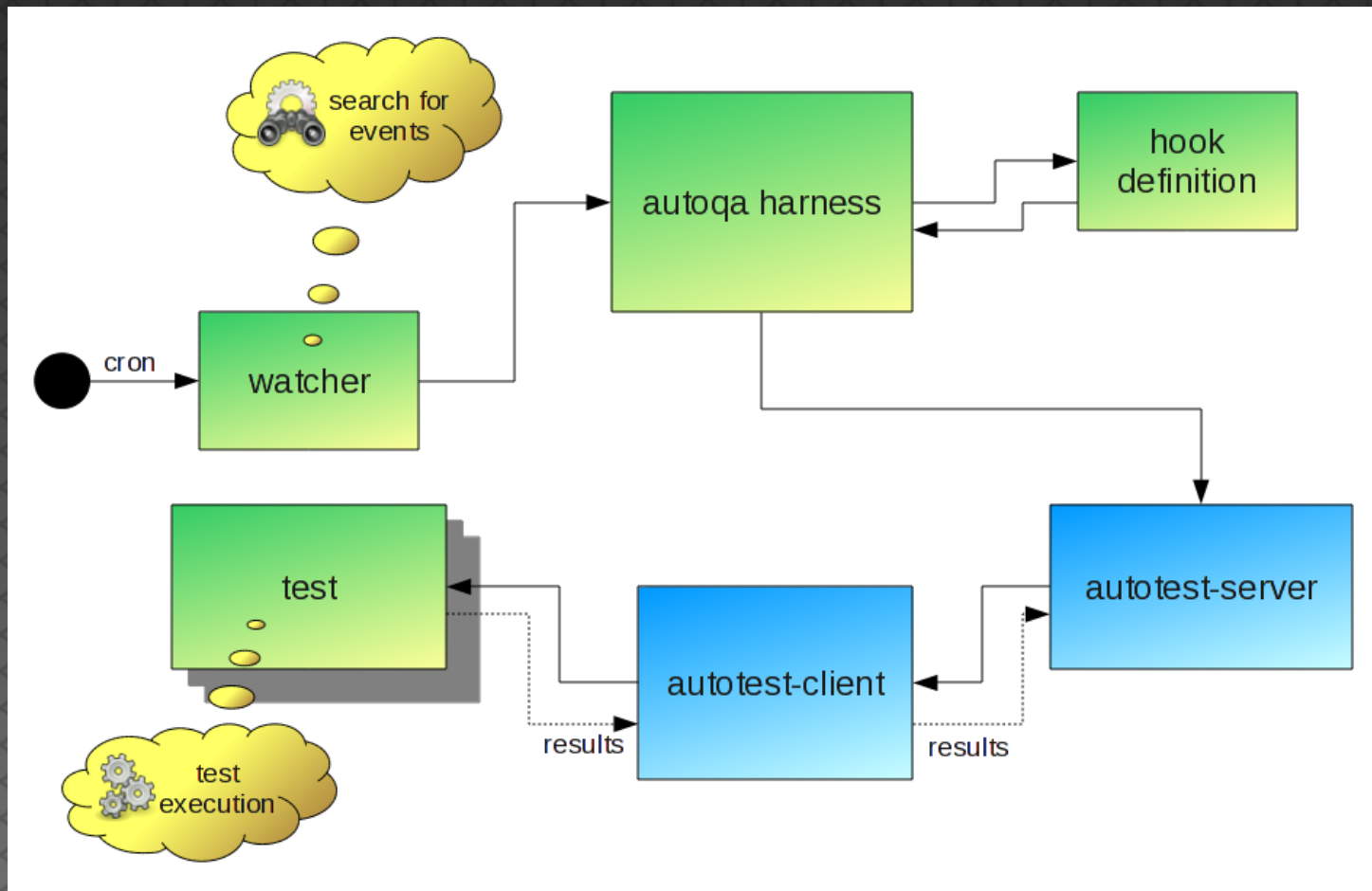
Hacking AutoQA

- different watchers watch for different events and call the autoqa harness

- hook definitions provide arguments to tests

- tests are scheduled with autotest-server

- autotest-server controls autotest-clients

- autotest-clients execute tests and return results

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Hacking AutoQA

AutoQA tests consist of:

- **test script** itself - written in any language, pick your favourite

- autoqa **test object** - main entry point for the test, written in Python, running test script, collecting results

- **control** files containing some metadata - job scheduling, etc

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Hacking AutoQA

```python
class rpmlint(AutoQATest):
    version = 1 # increment if setup() changes

    def setup(self):
        utils.system('yum -y install rpmlint')

    @ExceptionCatcher("self.run_once_failed")
    def run_once(self, envr, name, kojitag, **kwargs):
        koji = autoqa.koji_utils.SimpleKojiClientSession()
        pkgurls = koji.nvr_to_urls(envr)
        rpmdir = os.path.join(self.tmpdir, 'rpms')
        os.makedirs(rpmdir)
        print "Saving RPMs to %s" % rpmdir
        for p in pkgurls:
            # fetch package to rpmdir
            print "Grabbing %s" % p
            localfile = os.path.join(rpmdir, os.path.basename(p))
            autoqa.util.grabber.urlgrab(p, localfile)
        cmd = 'rpmlint %s' % rpmdir
        result = 'PASS'
        try:
            self.outputs = utils.system_output(cmd+" 2>&1", retain_output=True)
        except error.CmdError, e:
            result = 'FAIL'
            self.result = "FAILED"
            self.outputs = e.result_obj.stdout
```

Hacking AutoQA

AutoQA tests executed on localhost:

- ```
  autoqa post-koji-build
  --kojitag dist-f13-updates --local
  --test rpmlint icecream-0.9.6-2.fc13
  ```

- ```
  autoqa post-koji-build
  --kojitag dist-f13-updates --local
  --test rpmguard yum-3.2.28-3.fc13
  ```

- ```
  autoqa post-bodhi-update
  --title freeciv-3.0-1.fc13
  --target-tag dist-f13-updates
  --local --test upgradepath freeciv-3.0-1.fc13
  ```

LIVE DEMO

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The Future
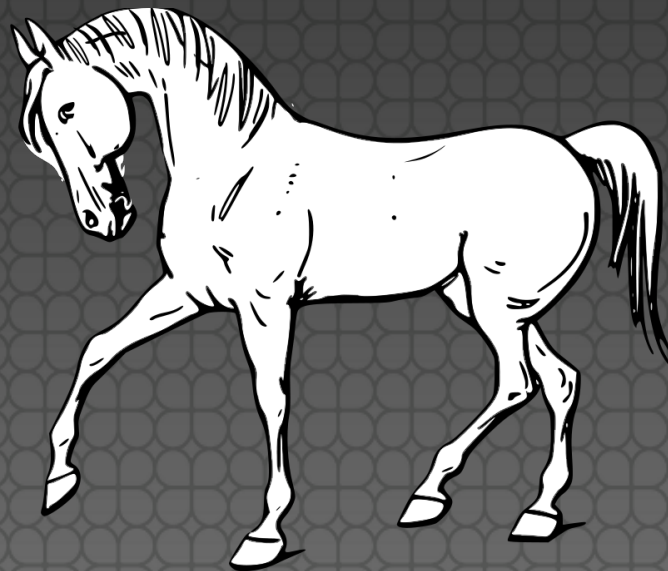
AutoQA future

Exciting things awaiting us:

- ResultsDB
    - all results stored here, well-defined API for querying from anywhere and anyone, acting as a service

- Fedora Message Bus
    - watchers periodically checking for changes are not good enough, we should use asynchronous message passing between all Fedora services (and also for public consumption)

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AutoQA future

Exciting things awaiting us:

- Bodhi/Koji integration
  - let's show green/red fields of AutoQA results right beside a new package build status in Koji or a proposed new package update status in Bodhi
- moving generic Red Hat tests to Fedora
  - initscripts test is the first example, we want to continue in this approach

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Help us

Helping AutoQA

Join us and help, if:

- you want to have something specific tested - just provide the script, we'll help you with AutoQA integration

- you want to work with us on AutoQA core architecture

- you're really bored over the long drizzly autumn nights

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Helping AutoQA

Useful links:

- https://fedoraproject.org/wiki/AutoQA
- https://fedorahosted.org/autoqa
- https://fedorahosted.org/mailman/listinfo/autoqa-devel
- https://fedoraproject.org/wiki/QA:Package_Update_Acceptance_Test_Plan

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Questions?

(answers not guaranteed)

Contact:
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Attributions

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