

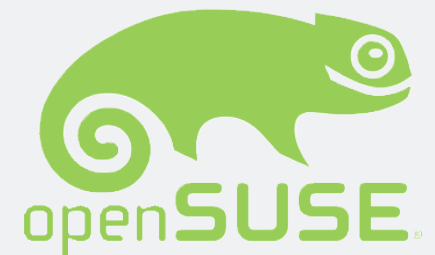


# Overview of openQA

- The heart of openSUSE's automated testing

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# What? openQA?

- It's v3 version now!
- openQA is an automated test tool that can test the whole installation process of an operating system.
- Originally developed by Bernhard M. Wiedemann with contributions from Dominik Heidler.
- Open source! openQA is free software released under the GPLv2 license.
- openQA is implemented in Perl.
- Uses QEMU (by default) for controlling the virtual machines, and uses OpenCV for fuzzy image matching. The backend has integrated with VNC.

# Why do we need it?



**Condamnés à la migraine sauvez votre tête**

Si vous vous contentez de dire, lorsque la migraine vous torture : "C'est un mauvais moment à passer", attendez-vous à passer beaucoup d'autres mauvais moments.

Au lieu d'attendre que l'étau se resserre et que votre tête éclate, faites une cure d'eau de Vichy à Vichy.

Dans la plupart des cas — le vôtre peut-être — la migraine est due à un fonctionnement défectueux de votre foie.

L'eau de Vichy vous rééquilibrera en profondeur.

Un médecin thermal dirigera et surveillera votre cure.

Peu à peu, vos crises s'espaceront, s'estomperont, disparaîtront.

Et pour éviter qu'elles ne reviennent, de retour chez vous, buvez un grand verre d'eau de Vichy avant chaque repas.

Voilà, c'est ainsi qu'il faut agir quand on a les pieds sur terre.

C'est encore le meilleur moyen de sauver sa tête.

faites appel à **vichy** célestins



\* <https://flic.kr/p/75utCF> (CC BY-NC-SA 2.0)



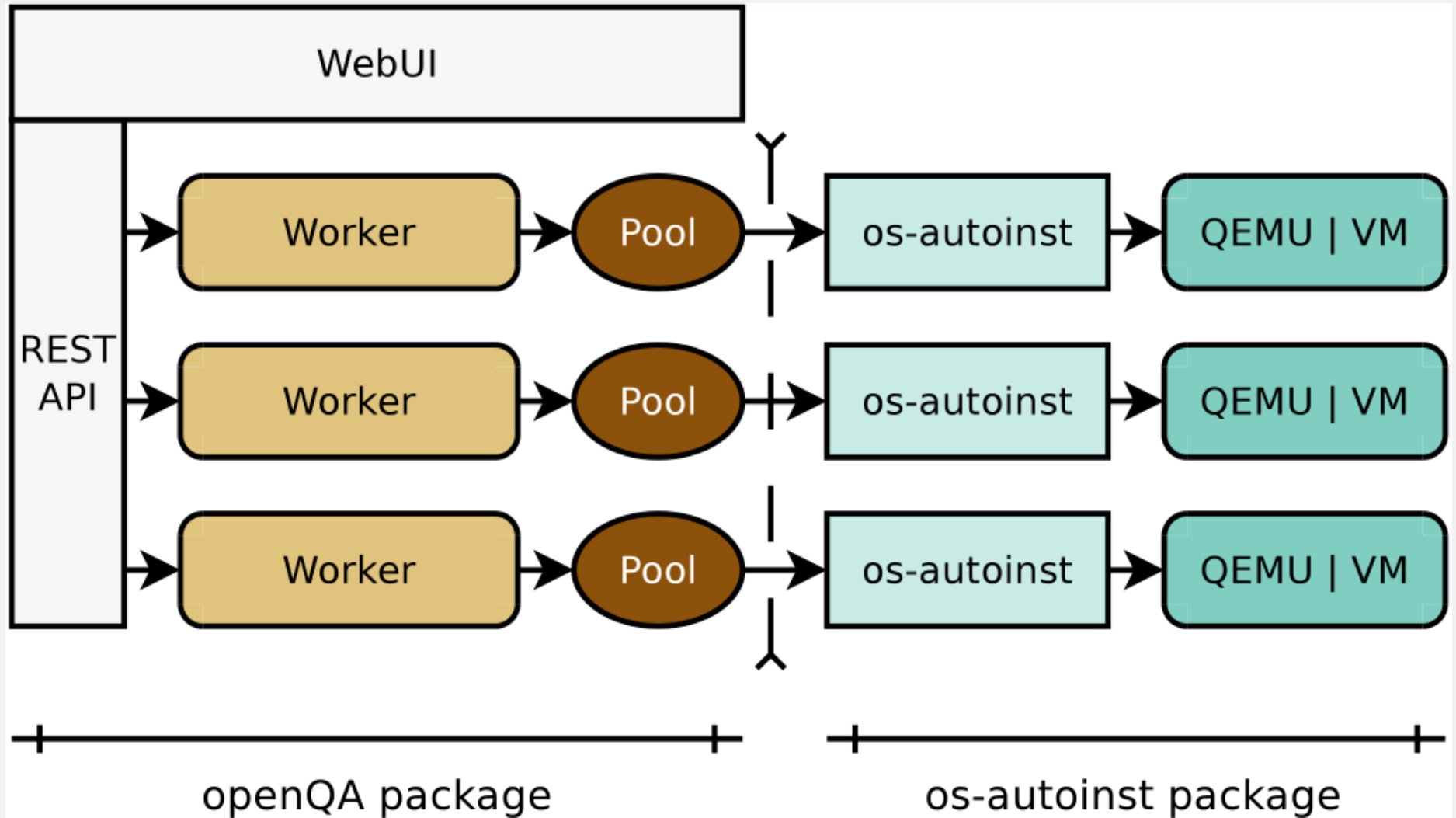
**What is it?**



# What features does it provide?

- Test the whole installation process
- Test distribution update/upgrade
- Regression testing
- Test text/graphic applications
- Test different jobs from one image
- Collected the logs once tests failed
- Instant screen output & video recording
- Provides easy to use web-based user interface
- Provides RESTful API

# Architecture



# Template(Products)

```
{
  "arch" : "x86_64",
  "distri" : "opensuse",
  "variables" : "",
  "settings" : [
    {
      "value" : "1",
      "key" : "DVD"
    },
    {
      "value" : "4700372992",
      "key" : "ISO_MAXSIZE"
    }
  ],
  "version" : "",
  "name" : "oS-DVD-x86_64",
  "flavor" : "DVD"
}
```

# Template(Machines)

```
{  
  "settings" : [  
    {  
      "key" : "QEMUCPU",  
      "value" : "qemu64"  
    }  
  ],  
  "backend" : "qemu",  
  "variables" : "",  
  "name" : "64bit"  
}
```



# Template(TestSuites)

```
{  
  "prio" : 51,  
  "name" : "lvm",  
  "settings" : [  
    {  
      "value" : "minimalx",  
      "key" : "DESKTOP"  
    },  
    {  
      "key" : "LVM",  
      "value" : "1"  
    }  
  ],  
  "variables" : ""  
}
```

# Template(JobTemplates)

```
{  
  "product" : {  
    "distri" : "opensuse",  
    "arch" : "x86_64",  
    "version" : "",  
    "flavor" : "DVD"  
  },  
  "machine" : {  
    "name" : "64bit"  
  },  
  "test_suite" : {  
    "name" : "lvm"  
  }  
}
```

# Create jobs

- Use command line tool script/client

- Example:

```
/usr/share/openqa/script/client isos post \  
ISO=openSUSE-Factory-NET-x86_64-Build0053-Media.iso \  
DISTR=opensuse VERSION=FTT FLAVOR=DVD \  
ARCH=x86_64 BUILD=20141014
```

# Create jobs(cont.)

- Use command line tool `script/clone_job.pl` to create a new job from existing one with modified settings

- Example:

```
/usr/share/openqa/script/clone_job.pl --from localhost --host localhost  
JOB_ID VAR1=foo VAR2=bar
```



# Jobs overview

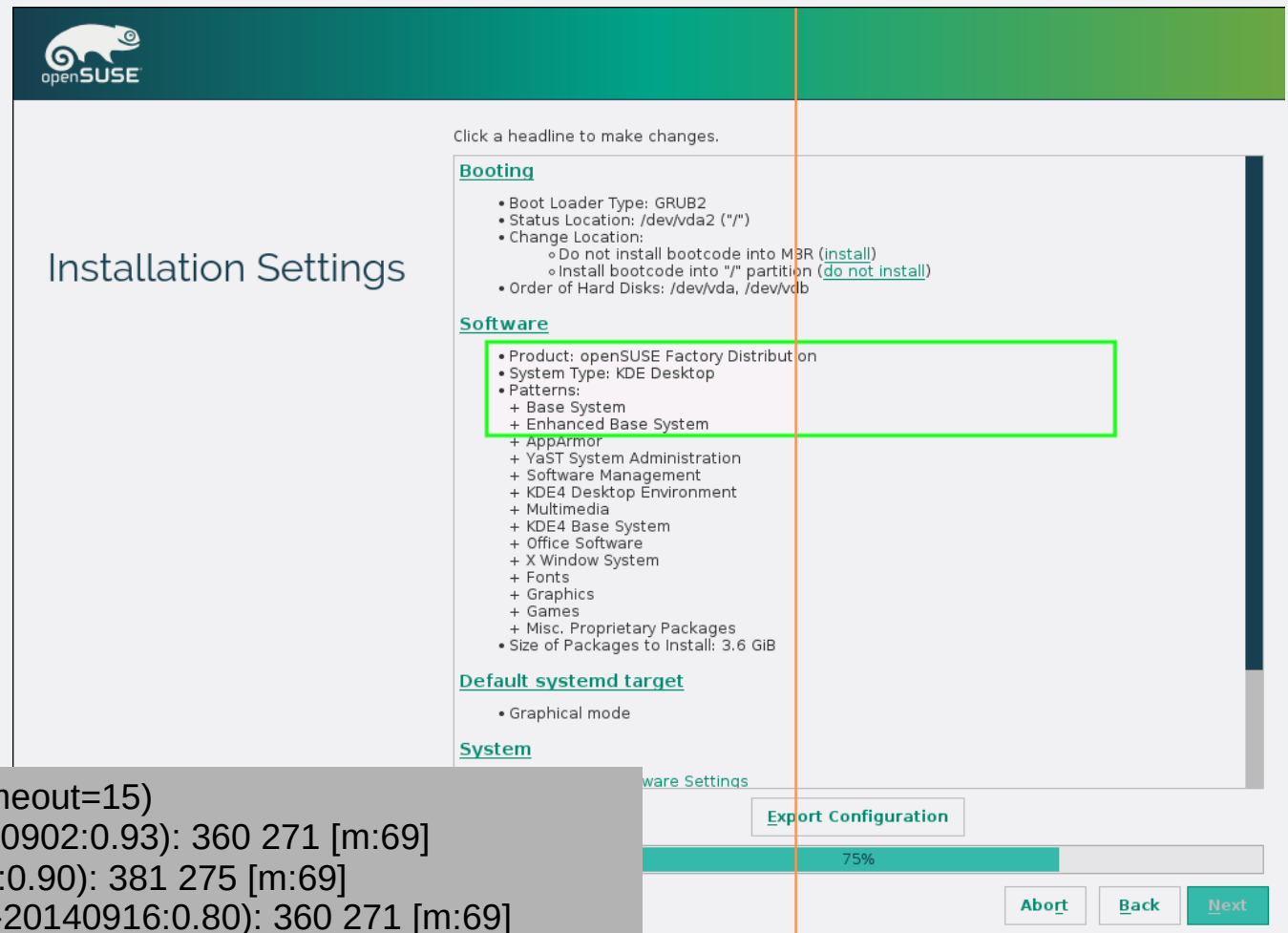
## Test results

This page lists 418 automated tests from the last 96 hours. [Select](#) | [Unselect](#) | [Restart selected \(0\)](#)

96 h  filter ☐ ignore incomplete Relevant (no finished clone) All Backends

#	clone	machine	distri	type	arch	build	testsuite	testtime	OK	unk	fail
		All	opensuse-FTT	All	All	20141011	All				
<input checked="" type="checkbox"/> 27417		64bit	opensuse-FTT	NET	x86_64	20141011	zdup-13.1-gnome	2014年10月15日 下午8:32:47	3		2
<input checked="" type="checkbox"/> 27148		32bit	opensuse-FTT	GNOME-Live	i686	20141011	gnome	2014年10月13日 下午2:00:56	43		
<input checked="" type="checkbox"/> 27147		32bit	opensuse-FTT	NET	i586	20141011	kde	2014年10月13日 下午1:59:09	51		
<input checked="" type="checkbox"/> 27139		64bit	opensuse-FTT	Rescue-CD	x86_64	20141011	rescue	2014年10月13日 上午11:59:03	31		3
<input checked="" type="checkbox"/> 27132		64bit	opensuse-FTT	Rescue-CD	x86_64	20141011	memtest	2014年10月13日 下午2:14:42	3		
<input checked="" type="checkbox"/> 27130		USBboot_64	opensuse-FTT	KDE-Live	x86_64	20141011	kde-live	2014年10月13日 上午9:31:16	2		2
<input checked="" type="checkbox"/> 27129		64bit	opensuse-FTT	KDE-Live	x86_64	20141011	mediacheck	2014年10月13日 下午12:39:11	3		
<input checked="" type="checkbox"/> 27128		64bit	opensuse-FTT	KDE-Live	x86_64	20141011	memtest	2014年10月13日 下午2:14:31	3		
<input checked="" type="checkbox"/> 27127		64bit	opensuse-FTT	KDE-Live	x86_64	20141011	kde-live	2014年10月13日 上午9:21:23	23		9
<input checked="" type="checkbox"/> 27126		64bit	opensuse-FTT	KDE-Live	x86_64	20141011	kde	2014年10月13日 上午7:09:47	44		
<input checked="" type="checkbox"/> 27125		USBboot_64	opensuse-FTT	GNOME-Live	x86_64	20141011	gnome-live	2014年10月13日 上午9:18:52	2		2
<input checked="" type="checkbox"/> 27124		64bit	opensuse-FTT	GNOME-Live	x86_64	20141011	mediacheck	2014年10月13日 下午12:39:01	3		
<input checked="" type="checkbox"/> 27123		64bit	opensuse-FTT	GNOME-Live	x86_64	20141011	memtest	2014年10月13日 下午2:14:21	3		
<input checked="" type="checkbox"/> 27122		64bit	opensuse-FTT	GNOME-Live	x86_64	20141011	gnome-live	2014年10月13日 上午9:08:42	25		6
<input checked="" type="checkbox"/> 27121		64bit	opensuse-FTT	GNOME-Live	x86_64	20141011	gnome	2014年10月13日 上午9:07:28	43		
<input checked="" type="checkbox"/> 27120		Laptop_64	opensuse-FTT	DVD	x86_64	20141011	gnome	2014年10月13日 上午9:03:47	51		1
<input checked="" type="checkbox"/> 27119		Laptop_64	opensuse-FTT	DVD	x86_64	20141011	kde	2014年10月13日 上午7:08:36	51		


# Needle matching



```
<<< assert_screen('inst-overview', timeout=15)
MATCH(inst-overview-minimalx-20140902:0.93): 360 271 [m:69]
MATCH(inst-overview-kde-20140912:0.90): 381 275 [m:69]
MATCH(inst-overview-minimalx-13.2-20140916:0.80): 360 271 [m:69]
MATCH(inst-overview-gnome-13.2-20140916:0.82): 362 273 [m:69]
MATCH(inst-overview-kde-20140902:1.00): 381 275 [m:69]
MATCH(inst-overview-gnome-20140902:0.94): 362 273 [m:69]
MATCH(inst-overview-minimalx-20140727:0.21): 399 217 [m:69]
>>> found inst-overview-kde-20140902, similarity 1.00 @ 381/275:
```

# Interactive mode&Needle editor

Actions



Name:  
partitioning-edit-proposal-button-dark-20141003

Tags:  
☒ partitioning-edit-proposal-button  
☒ ENV-DISTRI-opensuse  
☒ ENV-INSTLANG-en\_US  
 Add

JSON:

```
{
  "tags": [
    "ENV-DISTRI-opensuse",
    "ENV-INSTLANG-en_US",
    "partitioning-edit-proposal-button"
  ],
  "area": [
    {
      "ypos": 402,
      "xpos": 574,
      "type": "match",
      "width": 215,
      "height": 44
    },
    {
      "xpos": 573,
      "ypos": 478,
      "width": 216,
      "height": 44
    }
  ]
}
```

Test modules

boot

☒ isosize  
☒ bootloader









inst


☒ welcome  
☒ installation\_mode  
☒ partitioning  
☒ partitioning\_finish  
☒ installer\_timezone  
☒ logpackages  
☒ installer\_desktopselection  
☒ user\_settings  
☒ installation\_overview  
☒ start\_install  
☒ livecdreboot  
☒ first\_boot

Screenshot

Needles editor

Source code

Screens.Needle	Image	Areas	Matches	Tags
screenshot				
partitioning-edit-proposal-button-dark-20140902				



Suggested Partitioning

OCR

Create swap volume /dev/vda1 (1.46 GiB)

Create root volume /dev/vda2 (8.53 GiB) with btrfs

Create subvolume boot/grub2/i386-pc on device /dev/vda2

Create subvolume boot/grub2/x86\_64-efi on device /dev/vda2

Create subvolume home on device /dev/vda2

Create subvolume opt on device /dev/vda2

Create subvolume srv on device /dev/vda2

Create subvolume tmp on device /dev/vda2

Create subvolume usr/local on device /dev/vda2

Create subvolume var/crash on device /dev/vda2

Create subvolume var/lib/mailman on device /dev/vda2

Create subvolume var/lib/named on device /dev/vda2

Create subvolume var/lib/pgsql on device /dev/vda2

Create subvolume var/log on device /dev/vda2

Create subvolume var/opt on device /dev/vda2

Create subvolume var/spool on device /dev/vda2

Create subvolume var/tmp on device /dev/vda2

Edit Proposal Settings

Create Partition Setup...

Expert Partitioner...

Match

Exclude

Help

Release Notes...

Abort

Back

Next

15




















































# The needle

- An **screenshot image** plus a **json file**

```
{
  "area" : [
    {
      "xpos" : INTEGER,
      "ypos" : INTEGER,
      "width" : INTEGER,
      "height" : INTEGER,
      "type" : ( "match" | "ocr" | "exclude" ),
      "match" : INTEGER, // similarity percentage
    },
    ...
  ],
  "tags" : [
    STRING1,
    STRING2,
    ...
  ]
}
```



# Test result view

Flags	Test	Result	References		
	isotsize	OK			
	bootloader	OK	     		
	welcome	OK	   		
	installation_mode	OK			
	partitioning	OK			
	partitioning_finish	OK			
	installer_timezone	OK			
	logpackages	OK	    		
	installer_desktopselection	OK			
	user_settings	OK	  		
	installation_overview	OK			
	start_install	OK	   		
	livecdreboot	OK	   		
  	first_boot	OK	 		

\* Installation with KDE desktop

# Tests

- Written in Perl.
- For openSUSE, the tests are collected/defined in **os-autoinst-distri-opensuse**
- Using APIs from **os-autoinst**
- The behavior of tests can be controlled via variables
- Flag: Milestone? Important? Fatal?
- `is_applicable()` and `post_fail_hook()`

# Example

```
sub is_applicable {  
    return $vars{LIVETEST}; # check for $vars{SOMETHING}  
}  
  
sub run {  
    # wait for bootloader to appear  
    assert_screen "bootloader", 30; # timeout 30 seconds  
  
    # press enter to boot right away  
    send_key "ret";  
  
    # wait for the desktop to appear  
    assert_screen "desktop", 300;  
}  
  
sub test_flags {  
    # without anything - rollback to 'lastgood' snapshot if failed  
    # 'fatal' - whole test suite is in danger if this fails  
    # 'milestone' - after this test succeeds, update 'lastgood'  
    # 'important' - if this fails, set the overall state to 'fail'  
    return { important => 1 };  
}
```

**What is it good for  
openSUSE?**





# Benefits

- Make sure new installation not broken
- Main packages won't break current Factory
- Did the testing work before manual testing
- Developer/packager could know the issue at the first moment
- An important part of openSUSE development process

# Where to get it?

- GitHub <https://github.com/os-autoinst>
  - **openQA** containing documentation, server, worker and other support scripts.
  - **os-autoinst** with the standalone test tool and the API for tests.
  - **os-autoinst-distri-opensuse** containing the tests
  - **os-autoinst-needles-opensuse** containing the needles
- Binaries(RPM)
  - [http://software.opensuse.org/package/openQA?search\\_term=openQA](http://software.opensuse.org/package/openQA?search_term=openQA)

# Join&Contact

- openSUSE project management tool
  - <https://progress.opensuse.org/projects/openqav3>
- #openSUSE-factory IRC channel at Freenode
- opensuse-factory@opensuse.org

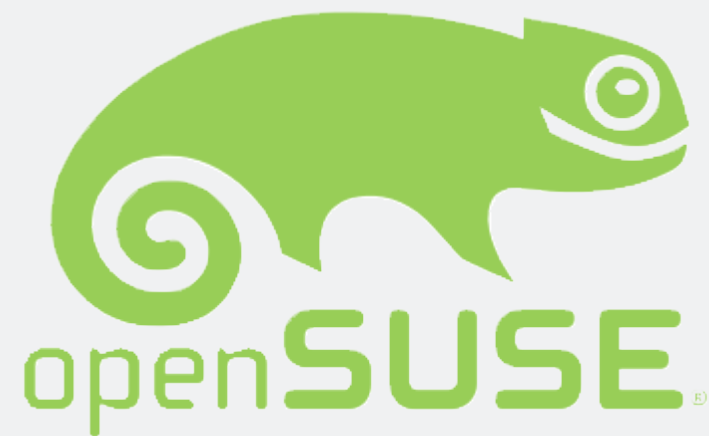
**Questions?**





**Thank you!**





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