From source to the package

Using the opensuse commander (osc)

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About me

Build Service engineer at SUSE

osc maintainer since last year

osc contributor since 12/2016

Overview

Create a package

Get the source

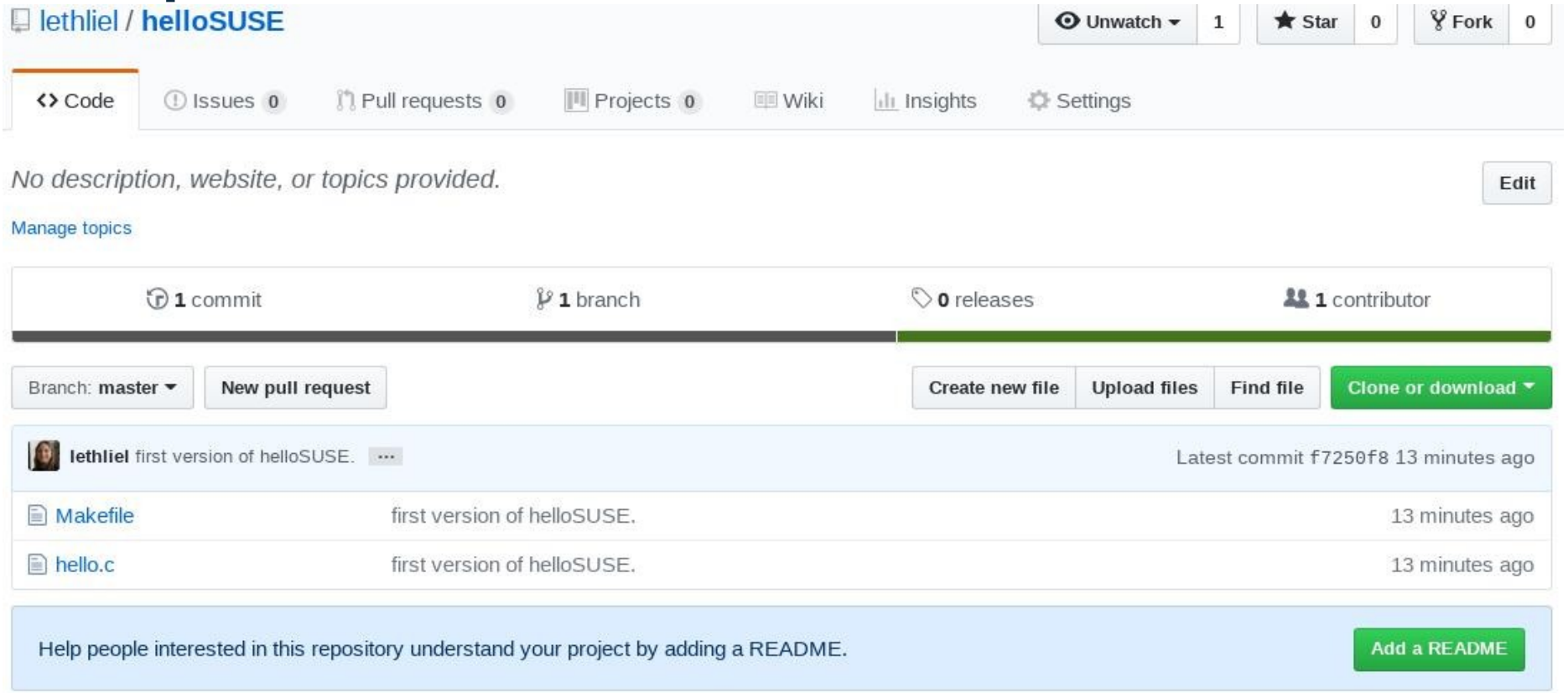
Build it!

Control the build (meta information)

Get more power

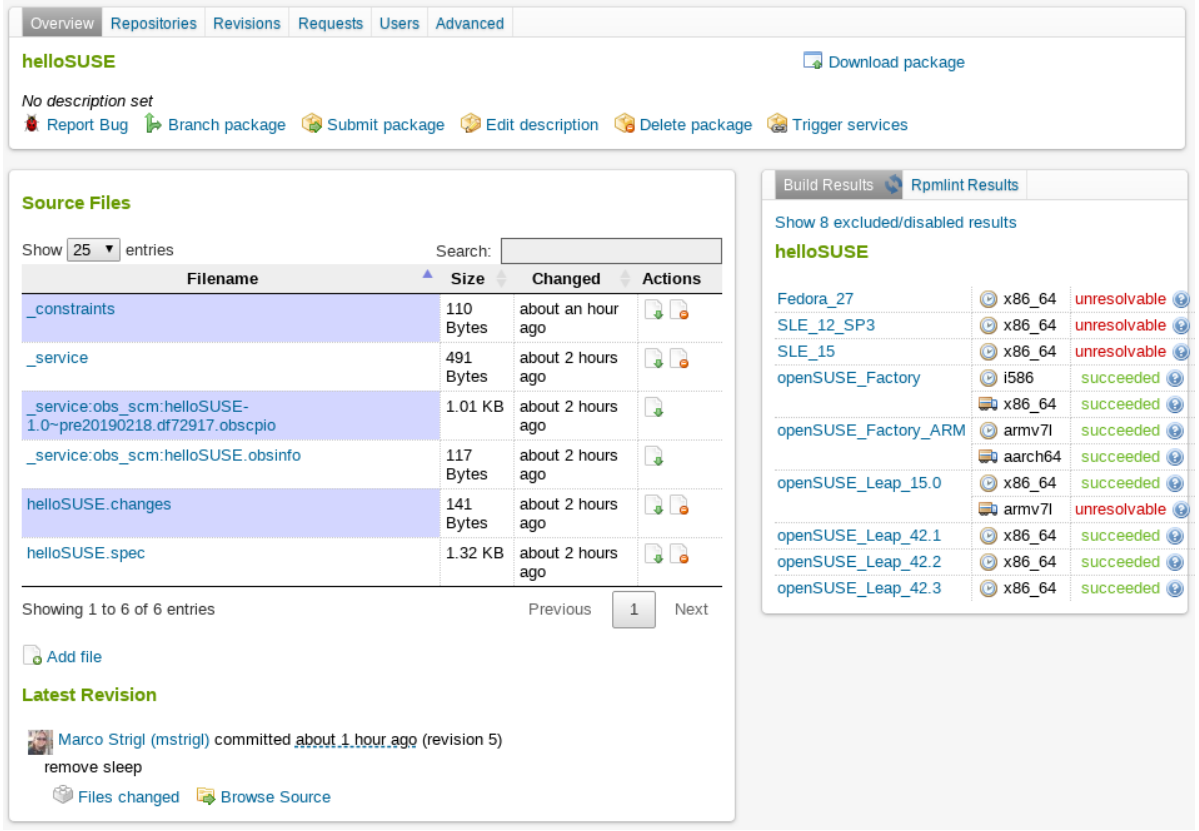
Investigating the build and the package

Example source



https://github.com/lethliel/helloSUSE

What we want to have



https://build.opensuse.org/package/show/home:mstrigl/helloSUSE

Creating a new package

- osc meta -e pkg hellooSC

```
<package name="helloSUSE" project="home:mstrigl">
  <title></title>
  <description></description>
</package>
```

- osc mkpac helloSUSE
- add spec file
- add sources

```
-rw-r--r-- 1 marco users 10240 Feb 18 11:35 helloSUSE-1.0.tar.gz
-rw-r--r-- 1 marco users   141 Feb 18 11:39 helloSUSE.changes
-rw-r--r-- 1 marco users  1349 Feb 18 11:37 helloSUSE.spec
```

Creating a new package

```
Name:           helloSUSE
Version:        1.0
Release:        0
License:        GPL-1.0-or-later
Summary:        A simple greater for the SUSECon 2019
Url:            https://github.com/lethliel/helloSUSE
Group:          Amusements/Toys/Other
Source:         %{name}-%{version}.tar.gz
BuildRoot:      %{_tmppath}/%{name}-%{version}-build

%description
This is just a small tool to great all the nice
people who are attending the SUSECon 2019

%prep
%setup -q

%build
make helloSUSE

%install
mkdir -p $RPM_BUILD_ROOT/usr/bin
install ./helloSUSE %{buildroot}/usr/bin/helloSUSE

%files
/usr/bin/helloSUSE

%changelog
```

Basics of a spec file

Name	The name of the package. This will be used as a label later on.
Version	Version of the software
Release	Version of the package (think of how many times has the software been packaged
License	Software license (https://spdx.org/licenses/)
Summary	Short description (displayed by rpm)
Url	Points to the documentation
Group	Group of the package
Source	Points to the source
BuildRoot	The build directory of the package

Basics of a spec file

%description	Detailed description of the software. More than one line
%prep	Is used to prepare the build environment, including: cleaning the old environment, setting up a new one, expanding the source archive.
%build	Here the build is performed. This can be very complex. But also very simple. In our case: make
%install	This section is used to “install” the application.
%files	List of files in the package
%changelog	Changes to the package

_service files (another way to get the source)

```
<services>
  <service name="obs_scm">
    <param name="url">git://github.com/lethliel/helloSUSE.git</param>
    <param name="scm">git</param>
    <param name="revision">master</param>
    <param name="versionformat">1.0~pre%cd.%h</param>
  </service>
  <service name="tar"/>
  <service name="recompress">
    <param name="file">*.tar</param>
    <param name="compression">gz</param>
  </service>
  <service name="set_version"/>
</services>
```

_service files

- osc service run (to run all services locally)

```
drwxr-xr-x 3 marco users 4096 Feb 18 11:51 helloSUSE
-rw-r--r-- 1 marco users  141 Feb 18 11:39 helloSUSE.changes
-rw-r--r-- 1 marco users 1349 Feb 18 11:37 helloSUSE.spec
-rw-r--r-- 1 marco users  440 Feb 18 11:56 _service
-rw-r--r-- 1 marco users 1033 Feb 18 11:56 _service:obs_scm:helloSUSE-1.0~pre20190218.df81158.obscpio
-rw-r--r-- 1 marco users  117 Feb 18 11:56 _service:obs_scm:helloSUSE.obsinfo
-rw-r--r-- 1 marco users  445 Feb 18 11:56 _service:recompress:tar:helloSUSE-1.0~pre20190218.df81158.tar.gz
-rw-r--r-- 1 marco users 1369 Feb 18 11:56 _service:set_version:helloSUSE.spec
```

- source got downloaded as .obscpio
- archived as tar
- compressed as gzip
- modified spec file _service:set_version:hellooSC.spec

_service files (another way to get the source)

```
Name:           helloSUSE
Version:        1.0~pre20190218.df81158
Release:        0
License:        GPL-1.0-or-later
Summary:        A simple greater for the SUSECon 2019
Url:            https://github.com/lethliel/helloSUSE
Group:          Amusements/Toys/Other
Source:         %{name}-%{version}.tar.gz
BuildRoot:      %{_tmppath}/%{name}-%{version}-build
```

_service files (another way to get the source)

```
<services>
  <service name="obs_scm">
    <param name="url">git://github.com/lethliel/helloSUSE.git</param>
    <param name="scm">git</param>
    <param name="revision">master</param>
    <param name="versionformat">1.0~pre%cd.%h</param>
  </service>
  <service name="tar" mode="buildtime"/>
  <service name="recompress" mode="buildtime">
    <param name="file">*.tar</param>
    <param name="compression">gz</param>
  </service>
  <service name="set_version" mode="buildtime"/>
</services>
```

Basics of services

There are a lot of services out there. The most important ones:

obs-service-download_file	download a file
obs-service-tar_scm	create a tar ball from svn/git/hg
obs-service-set_version	update spec file version string
obs-service_recompress	recompress files
obs-service-format_spec_file	reformats a specfile to SUSE standard

Basics of services

Modes:

default	Run after each commit on the server and locally before every build
trylocal	Just locally. Results are not saved with _service: prefix and will be skipped if they are the same
localonly	Just run locally. Results are prefixed with _service:
serveronly	Just run on the server
buildtime	Runs during the build. This means the service package becomes a BuildRequires. Service with mode=”buildtime” do not have network access
disabled	Disable the service

Local builds

- osc repos

```
openSUSE_Leap_42.3     x86_64
openSUSE_Leap_42.2     x86_64
openSUSE_Leap_42.1     x86_64
openSUSE_Leap_15.0     x86_64
openSUSE_Leap_15.0     armv7l
openSUSE_Factory_ARM   armv7l
openSUSE_Factory_ARM   aarch64
openSUSE_Factory       i586
openSUSE_Factory       x86_64
```

- osc build <repository> <arch> <recipe>
- osc build openSUSE_Factory x86_64 helloSUSE.spec
- the local build starts

Local builds

```
Run source service: /usr/lib/obs/service/obs_scm --url git://github.com/lethliel/helloSUSE.git --scm git --revision master --version
format 1.0~pre%cd.%h --outdir /home/marco/obs/home:mstrigl/helloSUSE/tmplUHZLz.obs_scm.service
Cloning into '/home/marco/obs/home:mstrigl/helloSUSE/helloSUSE'...
df81158f93a9b5bb44c7c15bba5f5c2d53219044
df81158f93a9b5bb44c7c15bba5f5c2d53219044
Building helloSUSE.spec for openSUSE_Factory/x86_64
Getting buildinfo from server and store to /home/marco/obs/home:mstrigl/helloSUSE/.osc/_buildinfo-openSUSE_Factory-x86_64.xml
Getting buildconfig from server and store to /home/marco/obs/home:mstrigl/helloSUSE/.osc/_buildconfig-openSUSE_Factory-x86_64
Updating cache of required packages
0.0% cache miss. 137/137 dependencies cached.

Verifying integrity of cached packages
using keys from openSUSE:Factory, home:mstrigl
Writing build configuration
Running build
logging output to /var/tmp/build-root/openSUSE_Factory-x86_64/.build.log...
[    0s] Memory limit set to 15791480KB
[    0s] Using BUILD_ROOT=/var/tmp/build-root/openSUSE_Factory-x86_64
[    0s] Using BUILD_ARCH=x86_64:i686:i586:i486:i386
[    0s]
[    0s]
[    0s] linux-1rhb.suse started "build helloSUSE.spec" at Mon Feb 18 11:06:29 UTC 2019.
[    0s]
[    0s]
[    0s] processing recipe /home/marco/obs/home:mstrigl/helloSUSE/helloSUSE.spec ...
[    0s] running changelog2spec --target rpm --file /home/marco/obs/home:mstrigl/helloSUSE/helloSUSE.spec
[    0s] init_buildsystem --configdir /usr/lib/build/configs --cachedir /var/cache/build --rpmlist /tmp/rpmlist.iu3kA4 /home/marco/o
bs/home:mstrigl/helloSUSE/helloSUSE.spec ...
[    1s] reordering...cycle: libncurses6 -> terminfo-base
[    1s]   breaking dependency terminfo-base -> libncurses6
[    1s] cycle: libcrack2 -> cracklib
[    1s]   breaking dependency cracklib -> libcrack2
[    1s] cycle: libdw1 -> libelf1 -> libebl-plugins
[    1s]   breaking dependency libebl-plugins -> libdw1
[    1s] cycle: libelf1 -> libebl-plugins
[    1s]   breaking dependency libelf1 -> libebl-plugins
[    1s] cycle: rpm -> rpm-config-SUSE
[    1s]   breaking dependency rpm -> rpm-config-SUSE
[    1s] done
[    1s] querying package ids...
[    1s] [1/137] keeping file-magic-5.35-1.5
```

Success?

```
[     3s] RPMLINT report:
[     3s] ===============
[     3s] 2 packages and 0 specfiles checked; 0 errors, 0 warnings.
[     3s]
[     3s]
[     3s] linux-1rhb.suse finished "build helloSUSE.spec" at Mon Feb 18 11:06:32 UTC 2019.
[     3s]
```

```
[     2s] + make helloSUSE
[     2s] make: *** No rule to make target 'helloSUSE'.  Stop.
[     2s] error: Bad exit status from /var/tmp/rpm-tmp.ZzJjx2 (%build)
[     2s]
[     2s]
[     2s] RPM build errors:
[     2s]     Bad exit status from /var/tmp/rpm-tmp.ZzJjx2 (%build)
[     2s]
[     2s] linux-1rhb.suse failed "build helloSUSE.spec" at Mon Feb 18 11:14:16 UTC 2019.
[     2s]
```

Meta information

But I don’t want to build my package for all those repositories!

```
openSUSE_Leap_42.3     x86_64
openSUSE_Leap_42.2     x86_64
openSUSE_Leap_42.1     x86_64
openSUSE_Factory_ARM   armv7l
openSUSE_Factory_ARM   aarch64
openSUSE_Factory       i586
openSUSE_Factory       x86_64
images                 x86_64
SLE_12_SP3             x86_64
Fedora_27              x86_64
Fedora_26              x86_64
Debian_8.0             i586
Debian_8.0             x86_64
Arch                   i586
Arch                   x86_64
```

Solution?

Disable the build on package level!

can be based on repository and arch or both

Let’s disable all non openSUSE / non x86_64 builds!

Meta information

osc meta -e pkg helloSUSE

```
openSUSE_Leap_42.3     x86_64
openSUSE_Leap_42.2     x86_64
openSUSE_Leap_42.1     x86_64
openSUSE_Factory_ARM   armv7l
openSUSE_Factory_ARM   aarch64
openSUSE_Factory       i586
openSUSE_Factory       x86_64
images                 x86_64
SLE_12_SP3             x86_64
Fedora_27              x86_64
Fedora_26              x86_64
Debian_8.0             i586
Debian_8.0             x86_64
Arch                   i586
Arch                   x86_64
```

```
<build>
  <disable arch="armv7l"/>
  <disable arch="aarch64"/>
  <disable arch="i586"/>
  <disable repository="images"/>
  <disable repository="SLE_12_SP3"/>
  <disable repository="Fedora_26"/>
  <disable repository="Fedora_27"/>
  <disable repository="Debian_8.0"/>
  <disable repository="Arch"/>
</build>
```

```
openSUSE_Leap_42.3   x86_64
openSUSE_Leap_42.2   x86_64
openSUSE_Leap_42.1   x86_64
openSUSE_Factory     x86_64
```

Meta information

prjconf	defines the build environment.	https://en.opensuse.org/openSUSE:Build_Service_prjconf
pkg	defines the package	https://en.opensuse.org/openSUSE:Build_Service_Tips_and_Tricks#Disable_build_of_packages
proj	defines the project	https://openbuildservice.org/help/manuals/obs-reference-guide/cha.obs.concepts.html#idm140561759279984

osc vc

add or modify changes file. (<package>.changes)

```
-------------------------------------------------------------------
Tue May 15 13:05:33 UTC 2018 - marco.strigl@suse.com

- initial package
~
```

We will cover a few guidelines later.

Add the files

- osc status

```
?      _service
?      helloSUSE.changes
?      helloSUSE.spec
```

- osc add *

```
A      helloSUSE.changes
A      helloSUSE.spec
A      _service
```

A	Added
C	Conflicted
D	Deleted
M	Modified
R	Replaced
?	not under version control
!	missing
S	Skipped
F	Frozen

Check in, please

- osc ci

```
- initial package
--This line, and those below, will be ignored--

A    _service
A    helloSUSE.changes
A    helloSUSE.spec

Diff for working copy: .
Index: helloSUSE.changes
===================================================================
--- helloSUSE.changes   (revision 0)
+++ helloSUSE.changes   (revision 0)
@@ -0,0 +1,4 @@
+-------------------------------------------------------------------
+Mon Feb 18 10:38:56 UTC 2019 - marco.strigl@suse.com
+
+- initial package

Index: helloSUSE.spec
===================================================================
--- helloSUSE.spec      (revision 0)
+++ helloSUSE.spec      (revision 0)
@@ -0,0 +1,45 @@
+#
+# spec file for package helloSUSE
+#
+# Copyright (c) 2018 SUSE LINUX Products GmbH, Nuernberg, Germany.
```

Submit to openSUSE:Factory

- osc sr openSUSE:Factory -m "I want this"
  creates a submit request to Factory and prints the request ID.

Submit to openSUSE:Factory

- osc request show <id>

```
Request: #677097

  submit:       home:mstrigl/helloSUSE@1 -> openSUSE:Factory


Message:
This is a demo package for SUSECon. Please ignore / decline this
request!

State:   declined   2019-02-18T11:42:33 namtrac
Comment: Once again, playing the bad cop. Declined!

Review:  new        Group: factory-staging                      2019-02-18T11:41:04
         new        Group: factory-auto                         2019-02-18T11:41:03
         new        Group: legal-auto                           2019-02-18T11:41:02

History: 2019-02-18T11:42:33 namtrac      Request got declined
         2019-02-18T11:41:01 mstrigl      Request created

Comments:
( 885404 ) On 2019-02-18 11:49:00 UTC mstrigl wrote:
Oh no. A shame that this did not reach Factory.
```

Advanced Topics

_constraints (more power)

_constraints files are used to use workers with special features or minimum system requirements.

Basic anatomy:

```
<constraints>
  <hardware>
    <disk>
      <size unit="G">500</size>
    </disk>
  </hardware>
</constraints>
```

_constraints (more power)

- osc checkconstraints

```
Repository              Arch                    Worker
----------              ----                    ------
openSUSE_Leap_42.3      x86_64                  0
openSUSE_Leap_42.2      x86_64                  0
openSUSE_Leap_42.1      x86_64                  0
openSUSE_Leap_15.0      x86_64                  0
```

- osc rbl home:mstrigl helloSUSE openSUSE_Factory x86_64

```
package build was not possible:

no compliant workers (constraints mismatch hint: hardware:disk)

Please adapt your constraints.
```

_constraints (more power)

- change the disk size to 50 GB

```
Repository                Arch                      Worker
----------                ----                      ------
openSUSE_Leap_42.3        x86_64                    25
openSUSE_Leap_42.2        x86_64                    25
openSUSE_Leap_42.1        x86_64                    25
```

- osc checkconstraints openSUSE_Factory x86_64

```
Worker
------
x86_64:cloud131:1
x86_64:cloud131:2
x86_64:cloud132:1
x86_64:cloud132:2
x86_64:cloud133:1
x86_64:cloud133:2
```

Basics of constraints

hostlabel		Label of the worker. Can be used for reproducible builds
sandbox		chroot/Xen/KVM/secure
linux		Kernel specific part
	version	Specific kernel version
	min	Minimal kernel version
	max	Maximal kernel version
flavor		Specific kernel flavor (default / smp)

Basics of constraints

hardware			Hardware features
	cpu		Cpu related
		flag	Features provided (like mmx). Can be used multiple times
		processors	Minimal amount of processors
	Disk	size	Minimal size of disk
	memory	size	Minimal size of memory (including swap)
	Physicalmemory	size	Minimal site of memory (swap excluded)

osc blame

```
1 (mstrigl      2019-02-18 11:30:46    31)
1 (mstrigl      2019-02-18 11:30:46    32) %prep
1 (mstrigl      2019-02-18 11:30:46    33) %setup -q
1 (mstrigl      2019-02-18 11:30:46    34)
1 (mstrigl      2019-02-18 11:30:46    35) %build
4 (mstrigl      2019-02-18 12:11:30    36) sleep 1000
1 (mstrigl      2019-02-18 11:30:46    37) make helloSUSE
```

That’s why the build stalls. I accidentally added a sleep 1000?!

Investigating a package

- osc info

```
Project name: home:mstrigl
Package name: helloSUSE
Path: /home/marco/obs/home:mstrigl/helloSUSE
API URL: https://api.opensuse.org
Source URL: https://api.opensuse.org/source/home:mstrigl/helloSUSE
srcmd5: 53ece2548e790bd5253b15be1dc24513
Revision: 5
Link info: None
```

- osc log

```
--------------------------------------------------------------------------------
r5 | mstrigl | 2019-02-18 12:12:43 | 53ece2548e790bd5253b15be1dc24513 | 1.0 |

remove sleep
--------------------------------------------------------------------------------
r4 | mstrigl | 2019-02-18 12:11:30 | 340fcc15766ee2a4c3a322e291abe4ae | 1.0 |

add sleep
--------------------------------------------------------------------------------
```

Investigating a package

- osc buildhistory openSUSE_Factory x86_64

```
time                 srcmd5                             vers-rel.bcnt    rev   duration
2019-02-18 11:33:25  fcaab0c9268a308d4b37ff613f39d064    1.0-1.1          1        120
2019-02-18 12:02:46  a3691d26a8c73a0b1f20cfaf290dc58f    1.0-3.1          3         66
```

- osc jobhistory openSUSE_Factory x86_64

```
time                 package    reason         code          build time    worker
2019-02-18 11:33:24  helloSUSE  new build      succeeded           2m  0s  cloud127:3
2019-02-18 11:55:32  helloSUSE  source change  failed              0m  0s  dispatcher
2019-02-18 12:02:45  helloSUSE  source change  succeeded           1m  6s  cumulus3:3
```

Investigating a package

- osc results

```
openSUSE_Leap_42.3   x86_64     finished
openSUSE_Leap_42.2   x86_64     finished
openSUSE_Leap_42.1   x86_64     building
openSUSE_Leap_15.0   x86_64     finished
openSUSE_Leap_15.0   armv7l     unresolvable
openSUSE_Factory_ARM armv7l     succeeded*
openSUSE_Factory_ARM aarch64    succeeded*
openSUSE_Factory     i586       building
openSUSE_Factory     x86_64     finished
SLE_15               x86_64     unresolvable*
SLE_12_SP3           x86_64     unresolvable*
Fedora_27            x86_64     unresolvable*
Fedora_26            x86_64     disabled*
```

Investigating a package

- osc results -v

```
openSUSE_Leap_42.3    x86_64     finished: succeeded
openSUSE_Leap_42.2    x86_64     finished: succeeded
openSUSE_Leap_42.1    x86_64     building: building on cloud125:2
openSUSE_Leap_15.0    x86_64     outdated (was: finished: succeeded)
openSUSE_Leap_15.0    armv7l     unresolvable:
      nothing provides rpm-build
      nothing provides gcc-PIE
openSUSE_Factory_ARM  armv7l     outdated (was: succeeded)
openSUSE_Factory_ARM  aarch64    succeeded(unpublished)
openSUSE_Factory      i586       building: building on cloud109:1
openSUSE_Factory      x86_64     finished: succeeded
SLE_15                x86_64     outdated (was: unresolvable:
      nothing provides obs-service-set_version)
SLE_12_SP3            x86_64     outdated (was: unresolvable:
      nothing provides obs-service-tar
      nothing provides obs-service-recompress
      nothing provides obs-service-set_version)
Fedora_27             x86_64     outdated (was: unresolvable:
      nothing provides obs-service-tar
      nothing provides obs-service-recompress
      nothing provides obs-service-set_version)
Fedora_26             x86_64     outdated (was: disabled)
```

Investigating a package

- osc getbinaries openSUSE_Factory x86_64

```
Creating directory "binaries"
_buildenv: 100%|#################################################################################| Time: 0:00:00
_statistics: 100%|###############################################################################| Time: 0:00:00
helloSUSE-1.0~pre20190218.df72917-3.1.x86_64.rpm: 100%|##########################################| Time: 0:00:00
rpmlint.log: 100%|###############################################################################| Time: 0:00:00
```

Investigating the environment

- osc chroot

```
mounting proc: sudo mount -n -tproc none /var/tmp/build-root/openSUSE_Factory-x86_64/proc
mounting sys: sudo mount -n -tsysfs none /var/tmp/build-root/openSUSE_Factory-x86_64/sys
mounting devpts: sudo mount -n -tdevpts -omode=0620,gid=5 none /var/tmp/build-root/openSUSE_Factory-x
86_64/dev/pts
running: sudo chroot /var/tmp/build-root/openSUSE_Factory-x86_64 su - abuild
abuild@linux-1rhb:~>
```

```
abuild@linux-1rhb:~> ls -l rpmbuild/
total 28
drwxr-xr-x 3 abuild abuild 4096 Feb 18 11:25 BUILD
drwxr-xr-x 3 abuild abuild 4096 Feb 18 11:25 BUILDROOT
drwxr-xr-x 2 abuild abuild 4096 Feb 18 11:25 OTHER
drwxr-xr-x 5 abuild abuild 4096 Feb 18 11:25 RPMS
drwxr-xr-x 3 abuild abuild 4096 Feb 18 11:25 SOURCES
drwxr-xr-x 2 abuild abuild 4096 Feb 18 11:25 SPECS
drwxr-xr-x 2 abuild abuild 4096 Feb 18 11:25 SRPMS
```

Investigating the environment

The local package cache is per default in “/var/tmp/osbuild-packagecache”
It can be necessary to delete it.

```
drwxr-xr-x    3 marco users   4096 Feb 14 12:57 openSUSE:Factory/
drwxr-xr-x    2 marco users   4096 Feb 12 14:47 openSUSE:Leap/
drwxr-xr-x    3 marco users   4096 Feb 14 11:57 openSUSE:Leap:15.0/
drwxr-xr-x    3 marco users   4096 Feb 14 11:57 openSUSE:Leap:15.0:NonFree/
drwxr-xr-x    3 marco users   4096 Feb 14 11:57 openSUSE:Leap:15.0:Update/
drwxr-xr-x    3 marco users   4096 Feb 12 14:47 openSUSE:Leap:42.1/
```

Proper changelog

- Describe what you have done and **WHY**
- Include version changes or point to a versioned changelog
- Mention bug references
- Do not delete bug references
- Mention added, deleted or changed patches

Thanks for your attention!

Q&A

SUSE®
We adapt. You succeed.