



Administrator Guide



Administrator Guide: Open Build Service

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Publication Date: 08/30/2017


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<https://www.suse.com/documentation> 

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About this Guide

This guide is part of the Open Build Service documentation. These books are considered to contain only reviewed content, establishing the reference documentation of OBS.

This guide does not focus on a specific OBS version. It is also not a replacement of the documentation inside of the [openSUSE Wiki \(https://en.opensuse.org/Portal:Build_Service\)](https://en.opensuse.org/Portal:Build_Service). However, content from the wiki may be included in these books in a consolidated form.

1 Available Documentation

The following documentation is available for this product:

Book "Reference Guide"

Administrator Guide

Book "Best Practice Guide"

Article "Beginner's Guide"

2 Feedback

Several feedback channels are available:

Bugs and Enhancement Requests

Help for openSUSE is provided by the community. Refer to <https://en.opensuse.org/Portal:Support> for more information.

Bug Reports



To report bugs for Open Build Service, go to <https://bugzilla.opensuse.org/>, log in, and click *New*.

Mail

For feedback on the documentation of this product, you can also send a mail to doc-team@suse.com. Make sure to include the document title, the product version and the publication date of the documentation. To report errors or suggest enhancements, provide a concise description of the problem and refer to the respective section number and page (or URL).

3 Documentation Conventions

The following notices and typographical conventions are used in this documentation:

- /etc/passwd: directory names and file names
- PLACEHOLDER: replace PLACEHOLDER with the actual value
- PATH: the environment variable PATH
- ls, --help: commands, options, and parameters
- user: users or groups
- package name: name of a package
- , : a key to press or a key combination; keys are shown in uppercase as on a keyboard
- *File*, *File > Save As*: menu items, buttons
- *Dancing Penguins* (Chapter *Penguins*, ↑Another Manual): This is a reference to a chapter in another manual.
- Commands that must be run with root privileges. Often you can also prefix these commands with the sudo command to run them as non-privileged user.

```
root # command
geeko > sudo command
```

- Commands that can be run by non-privileged users.

```
geeko > command
```

- Notices



Warning: Warning Notice

Vital information you must be aware of before proceeding. Warns you about security issues, potential loss of data, damage to hardware, or physical hazards.



Important: Important Notice

Important information you should be aware of before proceeding.



Note: Note Notice

Additional information, for example about differences in software versions.



Tip: Tip Notice

Helpful information, like a guideline or a piece of practical advice.

4 Lend a Hand?

The OBS documentation is written by the community. In other words: You can help!

Especially as an advanced user or an administrator of OBS, there will be many topics where you can pitch in even if your English is not the most polished. Conversely, if you are not very experienced with OBS but your English is good: We rely on community editors to improve the language.

This guide is written in DocBook XML which can be converted to HTML or PDF documentation.

To clone the source of this guide, use Git:

```
git clone https://github.com/openSUSE/obs-docu.git
```

To learn how to validate and generate the OBS documentation, see the file [README](#).

To submit changes, use GitHub pull requests:

1. Fork your own copy of the repository.
2. Commit your changes into the forked repository.
3. Create a pull request. This can be done at <https://github.com/openSUSE/obs-docu>.

It is even possible to host instance-specific content in the official Git repository, but it needs to be tagged correctly. For example, parts of this documentation are tagged as `<para os="open-suse">`. In this case, the paragraph will become only visible when creating the openSUSE version of a guide.

1 Installation and Configuration

1.1 Planning

For testing an own OBS instance and for small setups like only packaging some scripts from your administrators into RPMS and creating proper installation sources from them, the ready to use obs-server appliance images are the easiest way. You can download them from <http://openbuildservice.org/download/>.

If you want to use the OBS for your Linux software development with many packages, projects and users you should build your own installation. Depending on how many users and projects you have and for how many architectures you want to build packages you can split up the back-end (called partitioning) and have separate hosts for the front-end and database.

But for most installations it is still OK to run everything but workers one host with enough resources.

For flexibility and if you want some kind of high availability it is recommended to use virtualization for the different components.

1.1.1 Resource Planning

Normally for a small to middle installation a setup with everything except workers on one host is sufficient. You should have separate /srv volume for the back-end data, XFS as file system is best choice.

For each scheduler architecture you should add 4 GB RAM and one CPU core. For each build distribution you should add at least 50GB disk space per architecture.

A medium instance with about 50 users can easily run on a machine with 16GB RAM 4 cores and 1 TB storage. The storage of course depend on the size of your projects and how often you have new versions.

For bigger installations you can use separate networks for back-end communication, workers and front-end.

The reference installation on build.opensuse.org with lot of users, distributions runs on a partitioned setup with:

- a mysql cluster as database
- api-server: 16GB RAM 4 cores 50GB disk
- separate binary back-ends (scheduler, dispatcher, reposerver, publisher, warden)
- source server 11 GB RAM, 4 cores, 3 TB disk (RAM used mainly for caching)
- main back-end: 62 GB RAM (oversized), 16TB disk
- lot of workers (see - <https://build.opensuse.org/monitor>)

For build time and performance the count and performance of available worker hosts more important as the remaining parts.

1.2 Simple Installation

Simple installation means, all OBS services running on the same machine.



Important

It is very important that you read the **README.SETUP** file coming with your OBS version and follow the instructions there, because here maybe changes to this version.

Before you start the installation of the OBS, you should make sure that your hosts have the correct fully qualified hostname and DNS is working and can resolve all names.

1.2.1 Back-end Installation

The back-end hosts all sources and built packages. It also schedules the jobs. You need to install the "obs-server" package for this. You need to check the `/usr/lib/obs/server/BSConfig.pm` file, but the defaults should be good enough for the simple case.

You can control the different back-end components via `systemctl`. Basically you can enable/disable the service during booting the system and start/stop/restart it in a running system. For more information, see <https://www.freedesktop.org/software/systemd/man/systemctl.html#Commands>. For example, to restart the repository server use

```
systemctl restart obsrepserver.service
```

TABLE 1.1: SERVICE NAMES

Component	Service Name	Remarks
Source Server	obssrcserver.service	
Repository	Server obsrepserver.service	
Source	Services obsservice.service	
Download	obsdodup.service	since 2.7
Delta Storage	obsdeltastore.service	since 2.7
Scheduler	obsscheduler.service	
Dispatcher	obsdispatcher.service	
Publisher	obspublisher.service	
Signer	obssigner.service	
Warden	obswarden.service	

The sequence in the table reflects the start sequence, you need to enable the services with

```
systemctl start <name>
```

first and then you can start them:

```
systemctl start obssrcserver.service
systemctl start obsrepserver.service
systemctl start obsservice.service
systemctl start obsdodup.service
systemctl start obsdeltastore.service
systemctl start obsscheduler.service
systemctl start obsdispatcher.service
systemctl start obspublisher.service
systemctl start obssigner.service
systemctl start obswarden.service
```



Warning

The commands start services which are accessible from the outside. Do not do this on a system connected to an untrusted network or make sure to block the ports with a firewall.

1.2.2 Front-end Installation

You need to install the "obs-api" package for this and a MySQL server.

1.2.2.1 MySQL Setup

Make sure that the mysql server is started on every system reboot (use "insserv mysql" for permanent start). You should run `mysql_secure_installation` and follow the instructions.

Create the empty production databases:

```
# mysql -u root -p
mysql> create database api_production;
mysql> quit
```

Use a separate MySQL user (for example, `obs`) for the OBS access:

```
# mysql -u root -p
mysql> create user 'obs'@'%' identified by 'TopSecretPassword';
mysql> create user 'obs'@'localhost' identified by 'TopSecretPassword';
mysql> GRANT all privileges ON api_production.*
      TO 'obs'@'%', 'obs'@'localhost';
mysql> FLUSH PRIVILEGES;
mysql> quit
```

Configure your MySQL user and password in the "production" section of the api config: `/srv/www/obs/api/config/database.yml`

Example:

```
# MySQL (default setup). Versions 4.1 and 5.0 are recommended.
#
# Get the fast C bindings:
# gem install mysql
# (on OS X: gem install mysql -- --include=/usr/local/lib)
# And be sure to use new-style password hashing:
# http://dev.mysql.com/doc/refman/5.0/en/old-client.html
```

```
production:
  adapter: mysql2
  database: api_production
  username: obs
  password: TopSecretPassword
  encoding: utf8
  timeout: 15
  pool: 30
```

Now populate the database

```
cd /srv/www/obs/api/
sudo RAILS_ENV="production" rake db:setup
sudo RAILS_ENV="production" rake writeconfiguration
sudo chown -R wwwrun.www log tmp
```

Now you are done with the database setup.

1.2.2.2 Apache Setup

Now we need to configure the Web server. By default, you can reach the familiar web user interface and also api both on port 443 speaking https. Repositories can be accessed via http on port 82 (once some packages are built). An overview page about your OBS instance can be found behind '<http://localhost>'.

The obs-api package comes with an Apache vhost file, which does not need to get modified when you stay with these defaults: `/etc/apache2/vhosts.d/obs.conf`

Install the required packages via

```
zypper in obs-api apache2 apache2-mod_xforward rubygem-passenger-apache2 memcached
```

Add the following Apache modules in `/etc/sysconfig/apache2`:

```
APACHE_MODULES="... passenger rewrite proxy proxy_http xforward headers socache_shmcb"
```

Enable SSL in `/etc/sysconfig/apache2` via

```
APACHE_SERVER_FLAGS="SSL"
```

For production systems you should order official SSL certificates. For testing follow the instructions to create a self signed SSL certificate:

```
mkdir /srv/obs/certs
openssl genrsa -out /srv/obs/certs/server.key 1024
```

```
openssl req -new -key /srv/obs/certs/server.key \  
  -out /srv/obs/certs/server.csr  
openssl x509 -req -days 365 -in /srv/obs/certs/server.csr \  
  -signkey /srv/obs/certs/server.key -out /srv/obs/certs/server.crt  
cat /srv/obs/certs/server.key /srv/obs/certs/server.crt \  
  > /srv/obs/certs/server.pem
```

To allow the usage of https API in Web UI code you need to trust your certificate as well:

```
cp /srv/obs/certs/server.pem /etc/ssl/certs/  
c_rehash /etc/ssl/certs/
```

1.2.2.3 API Configuration

Check and edit `/srv/www/obs/api/config/options.yml`

If you change the hostnames/ips of the api, you need to adjust ***frontend_host*** accordingly. If you want to use LDAP, you need to change the LDAP settings as well. Look at the [Section 3.7, "Managing Users and Groups"](#) for details. You will find examples and more details in the [Section 2.1, "Configuration Files"](#).

It is recommended to enable

```
use_xforward: true
```

as well here.

Afterwards you can start the OBS web api and make it permanent via

```
systemctl enable apache2  
systemctl start apache2  
  
systemctl enable obsapidelayed.service  
systemctl start obsapidelayed.service  
  
systemctl enable memcached.service  
systemctl start memcached.service
```

Now you have you own empty instance running and you can do some online configuration steps.

1.2.3 Online Configuration

To customize the OBS instance you may need to configure some settings via the OBS API and Web user interface.

First you should change the password of the Admin account, for this you need first login as user Admin in the Web UI with the default password "opensuse". Click on the Admin link (right top of the page), here you can change the password.

After you changed the Admin password, you need to setup osc to use the Admin account for more changes. Here an example:

```
osc -c ~/.obsadmin_osc.rc -A https://api.testobs.org
```

Follow the instructions on the terminal.



Warning

The password is stored in clear text in this file by default, so you need to give this file restrictive access rights, only read/write access for your user should be allowed. **osc** allows to store the password in other ways (in keyrings for example), refer to the osc documentation for this.

Now you can check out the main configuration of the OBS:

```
osc -c ~/.obsadmin_osc.rc api /configuration >/tmp/obs.config
cat /tmp/obs.config
<configuration>
  <title>Open Build Service</title>
  <description>
    &lt;p class="description"&gt;
      The &lt;a href="http://openbuildservice.org"&gt; Open Build Service (OBS)&lt;/a&gt;
      is an open and complete distribution development platform that provides a
transparent
      infrastructure for development of Linux distributions, used by openSUSE, MeeGo
      and other distributions.
      Supporting also Fedora, Debian, Ubuntu, RedHat and other Linux distributions.
    &lt;/p&gt;
    &lt;p class="description"&gt;
      The OBS is developed under the umbrella of the &lt;a href="http://
www.opensuse.org"&gt;openSUSE project&lt;
      /a&gt;. Please find further informations on the &lt;
      a href="http://wiki.opensuse.org/openSUSE:Build_Service"&gt;openSUSE Project wiki
pages&lt;/a&gt;.
    &lt;/p&gt;

    &lt;p class="description"&gt;
      The Open Build Service developer team is greeting you. In case you use your OBS
productive
```

```

    in your facility, please do us a favor and add yourself at &lt;
    a href="http://wiki.opensuse.org/openSUSE:Build_Service_installations"&gt;
    this wiki page&lt;/a&gt;. Have fun and fast build times!
    &lt;/p&gt;
</description>
<name>private</name>
<download_on_demand>on</download_on_demand>
<enforce_project_keys>off</enforce_project_keys>
<anonymous>on</anonymous>
<registration>allow</registration>
<default_access_disabled>off</default_access_disabled>
<allow_user_to_create_home_project>on</allow_user_to_create_home_project>
<disallow_group_creation>off</disallow_group_creation>
<change_password>on</change_password>
<hide_private_options>off</hide_private_options>
<gravatar>on</gravatar>
<cleanup_empty_projects>on</cleanup_empty_projects>
<disable_publish_for_branches>on</disable_publish_for_branches>
<admin_email>unconfigured@openbuildservice.org</admin_email>
<unlisted_projects_filter>^home: .+</unlisted_projects_filter>
<unlisted_projects_filter_description>home projects</
unlisted_projects_filter_description>
<schedulers>
  <arch>armv7l</arch>
  <arch>i586</arch>
  <arch>x86_64</arch>
</schedulers>
</configuration>

```

Important

unlisted_projects_filter only admit Regular Expression (see RLIKE specifications of MySQL/MariaDB for more information) and **unlisted_projects_filter_description** is part of the link shown in the project list for filtering

You should edit this file according to your preferences, then sent it back to the server:

```
osc -c ~/.obsadmin_osc.rc api /configuration -T /tmp/obs.config
```

If you want to use an interconnect to another OBS instance to reuse the build targets you can do this as Admin via the Web UI or create a project with a **remoteurl** tag (see [Section 2.4.2, "Project Metadata"](#))

```
<project name="openSUSE.org">
```



```

<title>openSUSE.org Project</title>
<description>
This project refers to projects hosted on the Build Service
[...]

Use openSUSE.org:openSUSE:12.3 for example to build against the
openSUSE:12.3 project as specified on the opensuse.org Build Service.
</description>
  <remoteurl>https://api.opensuse.org/public</remoteurl>
</project>

```

You can create the project using a file with the above content with **osc** like this:

```
osc -c ~/.obsadmin_osc.rc meta prj openSUSE.org -F /tmp/openSUSE.org.meta
```

You also can import binary distribution, see [Section 3.2.2, "Importing Distributions"](#) for this.

The OBS has a list of available distributions used for build. This list is displayed to user, if they are adding repositories to their projects. This list can be managed via the API path `/distributions`

```
osc -c ~/.obsadmin_osc.rc api /distributions > /tmp/distributions.xml
```

Example distributions.xml file:

```

<distributions>
  <distribution vendor="SUSE" version="SLE-12-SP1" id="137">
    <name>SLE-12-SP1</name>
    <project>SUSE:SLE-12-SP1</project>
    <reponame>SLE-12-SP1</reponame>
    <repository>standard</repository>
    <link>http://www.suse.com/</link>
    <icon url="https://static.opensuse.org/distributions/logos/suse-SLE-12-8.png"
width="8" height="8"/>
    <icon url="https://static.opensuse.org/distributions/logos/suse-SLE-12-16.png"
width="16" height="16"/>
    <architecture>x86_64</architecture>
  </distribution>
</distributions>

```

You can add your own distributions here and update the list on the server:

```
osc -c ~/.obsadmin_osc.rc api /distributions -T /tmp/distributions.xml
```

1.3 Worker Farm

To not burden your OBS back-end daemons with the unpredictable load package builds can produce (think someone builds a monstrous package like LibreOffice) you should not run OBS workers on the same host as the rest of the back-end daemons.

Important

You back-end need to be configured to use the correct hostnames for the repo and source server and the ports need to be reachable by the workers. Also the IP addresses of the workers need to be allowed to connect the services. (look at the `/usr/lib/obs/server/BS-Config.pm::ipaccess` array).

You can deploy workers quite simply using the worker appliance. Or install a minimum system plus the `obs-worker` package on the hardware.

Edit the `/etc/sysconfig/obs-server` file, at least `OBS_SRC_SERVER`, `OBS_REPO_SERVERS` and `OBS_WORKER_INSTANCES` need to be set. More details in the [Section 2.1, "Configuration Files"](#).

start the worker:

```
systemctl enable obsworker
systemctl start obsworker
```

1.4 Distributed Setup

All OBS back-end daemons can also be started on individual machines in your network. Also the front-end Web server and the MySQL server can run on different machines. Especially for large scale OBS installations this is the recommended setup.

A setup with partitioning is very similar to the steps of the simple setup. Here we are only mention the differences to the simple setup.

Note

You need to make sure that the different machines can communicate via the network, it is very recommended to use a separate network for this to isolate it from the public part.

On all back-end hosts you need to install the obs-server package. On the front-end host you need to install the obs-api package.

Important

Only one source server instance can exist on a single OBS installation.

The binary back-end can be split on project level, this is called partitioning.

On one partition following services need to be configured and run:

1. repserver
2. schedulers
3. dispatcher
4. warden
5. publisher

You do not need to share any directories on File System level between the partitions.

Here some example for partitioning:

1. A main partition for everything not in the others (host mainbackend)
2. A home partition for all home projects of the users (host homebackend)
3. A release partition for released software projects (host releasebackend)

The configuration is done in the back-end config file `/usr/lib/obs/server/BSConfig.pm`. Most parts of the file can be shared between the back-ends.

Here the important parts of the mainbackend of our testobs.org installation:

```
[...]
my $hostname = Net::Domain::hostfqdn() || 'localhost';
# IP corresponding to hostname (only used for $ipaccess); fallback to localhost since
# inet_aton may fail to resolve at shutdown.
my $ip = quotemeta inet_ntoa(inet_aton($hostname) || inet_aton("localhost"));

my $frontend = 'api.testobs.org'; # FQDN of the Web UI/API server if it's not $hostname

# If defined, restrict access to the backend servers (bs_repserver, bs_srcserver,
# bs_service)
our $ipaccess = {
```

```

'127\..*' => 'rw', # only the localhost can write to the backend
"^$ip" => 'rw',   # Permit IP of FQDN
"10.20.1.100" => 'rw',   # Permit IP of srcsrv.testobs.org
"10.20.1.101" => 'rw',   # Permit IP of mainbackend.testobs.org
"10.20.1.102" => 'rw',   # Permit IP of homebackend.testobs.org
"10.20.1.103" => 'rw',   # Permit IP of releasebackend.testobs.org
'10.20.2.*' => 'worker', # build results can be delivered from any client in the
network
};

# IP of the Web UI/API Server (only used for $ipaccess)
if ($frontend) {
  my $frontendip = quotemeta inet_ntoa(inet_aton($frontend) || inet_aton("localhost"));
  $ipaccess->{$frontendip} = 'rw' ; # in dotted.quad format
}

# Change also the SLP reg files in /etc/slp.reg.d/ when you touch hostname or port
our $srcserver = "http://srcsrv.testobs.org:5352";
our $reposer = "http://mainbackend.testobs.org:5252";
our $serviceserver = "http://service.testobs.org:5152";
#
our @reposervers = ("
  http://mainbackend.testobs.org:5252,
  http://homebackend.testobs.org:5252,
  http://releasebackend.testobs.org:5252
");

# you can use different ports for worker connections
our $workersrcserver = "http://w-srcsrv.testobs.org:5353";
our $workerreposer = "http://w-mainbackend.testobs.org:5253";
[...]
our $partition = 'main';
#
# this defines how the projects are split. All home: projects are hosted
# on an own server in this example. Order is important.
our $partitioning = [
  'home:' => 'home',
  'release' => 'release'
  '.*'    => 'main',
];
our $partitionservers = {
  'home' => 'http://homebackend.testobs.org:5252',
  'release' => 'http://releasebackend.testobs.org:5252',
  'main' => 'http://mainbackend.testobs.org:5252',
};
[...]
```

On the other partition server you need to change "*our \$reposerver*", "*our \$workerreposerver*" and "*our \$partition*".

On all partition servers you need to start:

```
systemctl start obsrepservice.service
systemctl start obsscheduler.service
systemctl start obsdispatcher.service
systemctl start obspublisher.service
systemctl start obswarden.service
```

On the worker machines you should set of repo servers in the **OBS_REPO_SERVERS** variable. You can also define workers with a subset of the repo servers to prioritize partitions.

1.5 Monitoring

In this chapter you will find some general monitoring instructions for the Open Build Service. All examples are based on Nagios plugins, but the information provided should be easily adaptable for other monitoring solutions.

1.5.1 Endpoint Checks

1.5.1.1 HTTP Checks: Checking Whether the HTTP Server Responds

This check will output a critical if the HTTP server with ip address 172.19.19.19 (-I 172.19.19.19) listening on port 80 (-p 80) does not answer and output a warning if the HTTP return code is not 200. The server name that will be used is server (-H server) which is important if different virtual hosts are listening on the same port.

```
check_http -H server -I 172.19.19.19 -p 80 -u http://server
```

The same check, but this time it will check a ssl enabled HTTP server.

```
check_http -S -H server -I 172.19.19.19 -p 443 -u https://server
```

It is also possible to check the presence of a certain string in the HTTP response. In this case it will check for the string *Source Service Server*.

```
check_http -s "Source Service Server" -S -H server -I 172.19.19.19 -p 5152
```

Open Build Service HTTP endpoints that should be checked:

1. Web Interface / API: port 443
2. Repository Server: port 82
3. Package Repository Server: port 5252
4. Source Repository Server: port 5352
5. Source Service Server: port 5152

1.5.2 Common Checks

This is a list of common checks that should be run on each individual server.

1.5.2.1 Disk Space: Checking Available Disk Space

This check will output a warning if less than 10 percent disk space is available (-w 10) and output a critical if less than 5 percent disk space are available (-c 5). It will check all file systems except file systems with type *none* (-x none).

```
check_disk -w 10 -c 5 -x none
```

1.5.2.2 Memory Usage: Checking Available Memory

This check will output a warning if less than 10 percent memory is available (-w 10) and output a critical if less than 5 percent memory is available (-c 5). OS caches will be counted as free memory (-C) and it will check the available memory (-f). `check_mem.pl` is not a standard Nagios plugin and can be downloaded at <https://exchange.nagios.org/>.

```
check_mem.pl -f -C -w 10 -c 5
```

1.5.2.3 NTP: Checking Date and Time

This check will compare the local time with the time provided by the NTP server `pool.ntp.org` (-H `pool.ntp.org`). It will output a warning if the time differs by 0.5 seconds (-w 0.5) and output a critical if the time differs by 1 seconds (-c 1).

```
check_ntp_time -H pool.ntp.org -w 0.5 -c 1
```

1.5.2.4 Ping: Checking That the Server Is Alive

This plugin checks if the server responds to a ping request and it will output a warning if the respond time exceeds 200ms or 30 percent package loss (-w 200.0,30%) and output a critical if the respond time exceeds 500ms or 60 percent package loss.

```
check_icmp -H server -w 200.0,30% -c 500.0,60%
```

1.5.2.5 Load: Checking the Load on the Server

This check will output a warning if the load value exceeded 7.0 in the last minute, 6.0 in the last 5 minutes or 5.0 in the last 15 minutes (-w 7.0,6.0,5.0). It will output a critical if the load value exceeded 12.0 in the last minute, 8.0 in the last 5 minutes or 6.0 in the last 15 minutes (-c 12.0,8.0,6.0).

```
check_load -w 7.0,6.0,5.0 -c 12.0,8.0,6.0
```

1.5.2.6 Disk Health: Checking the Health of Local Hard Disks

This check is only relevant on physical systems with local storage attached to it. It will check the disk status utilizing the S.M.A.R.T interface and it will output a critical if any of the S.M.A.R.T values exceeds critical limits. `check_smartmon` is not a standard Nagios plugin and can be downloaded at <https://exchange.nagios.org/>.

```
check_smartmon --drive /dev/sda --drive /dev/sdb
```

1.5.3 Other Checks

1.5.3.1 MySQL: Checking That the MySQL Database Is Responding

This check will check that the MySQL database server is running and that the database *api_production* is available.

```
check_mysql -H localhost -u nagios -p xxxxxx -d api_production
```

MySQL Databases to check:

1. api_production
2. mysql

1.5.3.2 Backup Status: Checking That a Valid Backup Is Available

It is always advisable to check that the last backup run was successful and a recent backup is available. The check itself depends on the Backup solution that is used.

2 File System Overview

2.1 Configuration Files

2.1.1 Front-end Configuration

The front-end is configured with 4 files:

- /srv/www/obs/api/config/database.yml
- /srv/www/obs/api/config/options.yml
- /srv/www/obs/api/config/feature.yml
- /etc/apache2/vhosts.d/obs.conf

2.1.1.1 database.yml

This file has the information needed to access the database. It contains credentials for the database access and should be only readable by root and the group running the Web server (www).

The file has settings for the production, development and test ruby environment, for production systems only the production section is important.

Example production section

```
production:
  adapter: mysql2
  database: api_production
  username: obsapiuser
  password: topsecret
  encoding: utf8
  timeout: 15
  pool: 30
```

TABLE 2.1: DATABASE CONFIGURATION KEYWORDS

keyword	Description	Remarks
adapter	Database driver	only mysql databases are supported
database	Database name	do not change !

keyword	Description	Remarks
username	mysql user name	database user, not a system user
password	password for this user	clear text
encoding	codetable	
timeout	wait time in milliseconds	
pool	number of open connections per thread	
socket	path to the mysql socket	same host only
host	IP address or hostname of the mysql server	for remote servers
port	port number of the mysql server	for remote servers

2.1.1.2 options.yml

The configuration file `/srv/www/obs/api/config/options.yml` is the default configuration file for the Open Build Service Web UI and API. It contains configuration parameters for example for back-end connections and connection to the API. Important are the configurations for source and front-end hosts The configuration for LDAP authentication is also located in this file.



Note

More and more configurations will be moved to the database and do not longer exist in this file. The database configuration can be accessed via the API `/configuration` path.

TABLE 2.2: options.yml CONFIGURATION ITEMS

Config item	Description	Values <u>default</u>	Remarks
use_xforward	Use mod_xforward module	<u>true</u> false	Apache only, should be true

Config item	Description	Values <u>default</u>	Remarks
use_nginx_redirect	Use X-Accel-Redirect	<u>/inter-</u> <u>nal_redirect</u>	Nginx only
min_votes_for_rating	Minimum votes for a rating	integer <u>3</u>	
response_schema_validation	Set to true to verify XML responses comply to the schema	true <u>false</u>	test/debug option
source_host	back-end source server host	<u>localhost</u>	
source_port	back-end source server port	integer <u>5352</u>	
source_protocol	back-end source server protocol	<u>http</u> , https	
front_end_host	Front-end host	<u>localhost</u>	
frontend_port	Front-end port	integer <u>443</u>	
frontend_protocol	Front-end protocol	http <u>https</u>	
external_frontend_host	External Front-end host		if your users access the hosts through a proxy or different name
external_frontend_port	External Front-end port	integer <u>443</u>	
external_frontend_protocol	External Front-end protocol	http <u>https</u>	
extended_backend_log	Extended back-end log	<u>true</u> false	test/debug option

Config item	Description	Values <u>default</u>	Remarks
proxy_auth_mode:	turn proxy mode on/off	<u>:off</u> :on	see LDAP section
proxy_auth_test_user	Test user	<u>coolguy</u>	test/debug option
proxy_auth_test_email	Email of Test user	<u>coolguy@ exam- ple.com</u>	test/debug option
global_write_through	if set to false, the API will only fake writes to back-end	<u>true</u> false	test/debug option
auto_cleanup_after_days	not longer used	<u>30</u>	moved to /configuration API
errbit_api_key	API key of the application		test/debug option
errbit_host	installation of errbit.com a Ruby error catcher		test/debug option
errbit_api_key	API key of the application		test/debug option
ldap_mode:	OBS LDAP mode on/off	<u>:off</u> :on	see LDAP section

Example options.yml

```
#
# This file contains the default configuration of the Open Build Service
# API.
#

# Make use of mod_xforward module in apache
use_xforward: true

# Make use of X-Accel-Redirect for Nginx.
```

```
# http://kovyrin.net/2010/07/24/nginx-fu-x-accel-redirect-remote
#use_nginx_redirect: /internal_redirect

# Minimum count of rating votes a project/package needs to # be taken in
# account
# for global statistics:
min_votes_for_rating: 3

# Set to true to verify XML reponses comply to the schema
response_schema_validation: false

# backend source server
source_host: localhost
source_port: 5352
#source_protocol: https

# api access to this instance
frontend_host: localhost
frontend_port: 443
frontend_protocol: https
# if your users access the hosts through a proxy (or just a different name,
# use this to
# overwrite the settings for users)
#external_frontend_host: api.opensuse.org
#external_frontend_port: 443
#external_frontend_protocol: https

extended_backend_log: true

# proxy_auth_mode can be :off, :on or :simulate
proxy_auth_mode: :off

# ATTENTION: If proxy_auth_mode'is :on, the frontend takes the user
# name that is coming as headervalue X-username as a
# valid user does no further authentication. So take care...
proxy_auth_test_user: coolguy
proxy_auth_test_email: coolguy@example.com

# set this to enable auto cleanup requests after the given days
auto_cleanup_after_days: 30

#schema_location

#version

# if set to false, the API will only fake writes to backend (useful in
```

```
# testing)
# global_write_through: true

# see
# http://colszowka.heroku.com/2011/02/22/setting-up-your-custom-hoptoad-notifier-
endpoint-for-free-using-errbit-on-heroku
#errbit_api_key: api_key_of_your_app
#errbit_host: installation.of.errbit.com
```

2.1.1.3 feature.yml

The configuration file `/srv/www/obs/api/config/feature.yml` contains the default configuration about features that can be enabled or disabled in Open Build Service.

TABLE 2.3: feature.yml CONFIGURATION ITEMS

Config item	Description	Values <u>default</u>	Remarks
image_templates	enable/disable image template feature	<u>true</u> false	see Reference Guide for more information

Example feature.yml

```
features:
  image_templates: true
```

2.1.1.4 Apache Virtual Host obs.conf

The Apache configuration depends on the Apache version and which extra options are used, so use the documentation of the Apache version you are using.

Here as example the standard configuration used by the appliance: Apache vhost example

```
Listen 82
# May needed on old distributions or after an update from them.
#Listen 443

# Passenger defaults
PassengerSpawnMethod "smart"
PassengerMaxPoolSize 20
#RailsEnv "development"

# allow long request urls and being part of headers
LimitRequestLine 20000
```

```

LimitRequestFieldsize 20000

# Just the overview page
<VirtualHost *:80>
    # just give an overview about this OBS instance via static web page
    DocumentRoot "/srv/www/obs/overview"

    <Directory /srv/www/obs/overview>
        Options Indexes
        Require all granted
    </Directory>
</VirtualHost>

# Build Results
<VirtualHost *:82>
    # The resulting repositories
    DocumentRoot "/srv/obs/repos"

    <Directory /srv/obs/repos>
        Options Indexes FollowSymLinks
        Require all granted
    </Directory>
</VirtualHost>

# OBS WEB UI & API
<VirtualHost *:443>
    ServerName api

    # General setup for the virtual host
    DocumentRoot "/srv/www/obs/api/public"
    ErrorLog /srv/www/obs/api/log/apache_error.log
    TransferLog /srv/www/obs/api/log/apache_access.log

    PassengerMinInstances 2
    PassengerPreStart https://api

    SSLEngine on

    # SSL protocols
    # Supporting TLS only is adequate nowadays
    SSLProtocol all -SSLv2 -SSLv3

    # SSL Cipher Suite:
    # List the ciphers that the client is permitted to negotiate.
    # We disable weak ciphers by default.

```

```

# See the mod_ssl documentation or "openssl ciphers -v" for a
# complete list.
SSLCipherSuite ALL:!aNULL:!eNULL:!SSLv2:!LOW:!EXP:!MD5:@STRENGTH

SSLCertificateFile /srv/obs/certs/server.crt
SSLCertificateKeyFile /srv/obs/certs/server.key

<Directory /srv/www/obs/api/public>
  AllowOverride all
  Options -MultiViews

  # This requires mod_xforward loaded in apache
  # Enable the usage via options.yml
  # This will decrease the load due to long running requests a lot (unloading
from rails stack)
  XForward on

  Require all granted
</Directory>

SetEnvIf User-Agent ".*MSIE [1-5].*" \
    nokeepalive ssl-unclean-shutdown \
    downgrade-1.0 force-response-1.0

CustomLog /var/log/apache2/ssl_request_log    ssl_combined

# from http://guides.rubyonrails.org/asset_pipeline.html
<LocationMatch "^/assets/.*$" >
  Header unset ETag
  FileETag None
  # RFC says only cache for 1 year
  ExpiresActive On
  ExpiresDefault "access plus 1 year"
</LocationMatch>

SetEnvIf User-Agent ".*MSIE [1-5].*" \
    nokeepalive ssl-unclean-shutdown \
    downgrade-1.0 force-response-1.0

## Older firefox versions needs this, otherwise it wont cache anything over SSL.
Header append Cache-Control "public"

</VirtualHost>

```


2.1.2 Back-end Configuration

The Back-end is configured with 2 files:

- `/etc/sysconfig/obs-server` - a shell script used for workers and the OBS start scripts
- `/usr/lib/obs/server/BSConfig.pm` - a perl script defining some global variables

2.1.2.1 `/etc/sysconfig/obs-server`

This script is used to setup the basic paths and the worker. the most important settings are the **OBS_SRC_SERVER** and **OBS_REPO_SERVERS** and the **OBS_WORKER_INSTANCES**.

TABLE 2.4: `obs-server` VARIABLES

Variable	Description	Values <u>default</u>	Remarks
<code>OBS_BACKENDCODE_DIR</code>	Path to the back-end scripts	<code>/usr/lib/obs/server/</code>	
<code>OBS_RUN_DIR</code>	communication directory base	<code>/srv/obs/run</code>	
<code>OBS_LOG_DIR</code>	logging directory	<code>/srv/obs/log</code>	
<code>OBS_BASE_DIR</code>	base directory	<code>/srv/obs</code>	
<code>OBS_API_AUTOSETUP</code>	Automatically set-up API and Web UI	yes <u>no</u>	appliance only, will overwrite config files
<code>OBS_SRC_SERVER</code>	source server host	<code>localhost:5352</code>	only one
<code>OBS_REPO_SERVERS</code>	repository server host	<code>localhost:5252</code>	maybe a list
<code>OBS_WORKER_INSTANCES</code>	number of build instances	integer <u>0</u>	
<code>OBS_WORKER_INSTANCE_NAMES</code>	names of the workers		space-separated list

Variable	Description	Values <u>default</u>	Remarks
OBS_WORKER_DIRECTORY	worker base directory		
OBS_WORKER_PORTBASE	The base for port numbers used by worker	integer <u>0</u>	0 OS assign number
OBS_WORKER_JOBS	Number of parallel compile jobs	integer <u>1</u>	
OBS_WORKER_TEST_MODE	Run in test mode	yes <u>no</u>	
OBS_WORKER_HOST LABELS	one or more labels for the build host		may used by constraints
OBS_USE_SLP	Register in SLP server	<u>yes</u> no	
OBS_CACHE_DIR	cache directory for downloaded packages		
OBS_CACHE_SIZE	package cache size		in MB
OBS_WORKER_NICE_LEVEL	nice level of running workers	<u>18</u>	
OBS_VM_TYPE	VM type	auto xen kvm lxc zvm emulator:\$arch none	
OBS_VM_KERNEL	Set kernel used by worker	<u>none</u> (/boot/vmlinuz)	KVM option
OBS_VM_INITRD	initrd used by worker	<u>none</u> (/boot/vmlinuz)	KVM option

Variable	Description	Values <u>default</u>	Remarks
OBS_VM_DISK_AUTOSETUP_ROOT_FILESIZE	Autosetup disk size	<u>4096</u>	in MB
OBS_VM_DISK_AUTOSETUP_SWAP_FILESIZE	Autosetup swap size	<u>1024</u>	on MB
OBS_VM_DISK_AUTOSETUP_FILESYSTEM	File System used with autosetup	<u>ext3</u>	
OBS_VM_DISK_AUTOSETUP_MOUNT_OPTIONS	Special mount options		
OBS_VM_USE_TMPFS	Enable build in memory	yes <u>no</u>	requires much memory
OBS_INSTANCE_MEMORY	Memory allocated for a VM	<u>512</u>	
OBS_STORAGE_AUTOSETUP	storage auto configuration	yes <u>no</u>	may destroy disk content
OBS_SETUP_WORKER_PARTITIONS	LVM via obsstorage-setup	take_all <u>use_obs_vg</u> none	may destroy disk content
OBS_WORKER_CACHE_SIZE	LVM partition for cache size		
OBS_WORKER_ROOT_SIZE	LVM partition for root size		
OBS_WORKER_SWAP_SIZE	LVM partition for swap size		
OBS_WORKER_BINARIES_PROXY	proxy service for caching binaries		
OBS_ROOT_SSHD_KEY_URL	ssh pub key to allow root user login		for mass deployment

Variable	Description	Values <u>default</u>	Remarks
OBS_WORKER_SCRIPT_URL	URL to the initial script		

For workers the settings could be declared in the */etc/buildhost.config* file as well.

```
#
# NOTE: all these options can be also declared in /etc/buildhost.config on each worker
# differently.
#
## Path:      Applications/OBS
## Description: The OBS backend code directory
## Type:      string
## Default:   ""
## Config:    OBS
#
# An empty dir will lead to the fall back directory, typically /usr/lib/obs/server/
#
OBS_BACKENDCODE_DIR=""

## Path:      Applications/OBS
## Description: The base for OBS communication directory
## Type:      string
## Default:   ""
## Config:    OBS
#
# An empty dir will lead to the fall back directory, typically /srv/obs/run
#
OBS_RUN_DIR="/srv/obs/run"

## Path:      Applications/OBS
## Description: The base for OBS logging directory
## Type:      string
## Default:   ""
## Config:    OBS
#
# An empty dir will lead to the fall back directory, typically /srv/obs/log
#
OBS_LOG_DIR="/srv/obs/log"

## Path:      Applications/OBS
## Description: The base directory for OBS
## Type:      string
## Default:   ""
```

```

## Config:      OBS
#
# An empty dir will lead to the fall back directory, typically /srv/obs
#
OBS_BASE_DIR=""

## Path:        Applications/OBS
## Description: Automatically set up API and Web UI for OBS server, be warned, this will
                replace config files!
## Type:        ("yes" | "no")
## Default:     "no"
## Config:      OBS
#
# This is usally only enabled on the OBS Appliance
#
OBS_API_AUTOSETUP="yes"
#
# NOTE: all these options can be also declared in /etc/buildhost.config on each worker
                differently.
#

## Path:        Applications/OBS
## Description: define source server host to be used
## Type:        string
## Default:     ""
## Config:      OBS
#
# An empty setting will point to localhost:5352 by default
#
OBS_SRC_SERVER=""

## Path:        Applications/OBS
## Description: define repository server host to be used
## Type:        string
## Default:     ""
## Config:      OBS
#
# An empty setting will point to localhost:5252 by default
#
OBS_REPO_SERVERS=""

## Path:        Applications/OBS
## Description: define number of build instances
## Type:        integer
## Default:     0
## Config:      OBS
#

```

```

# 0 instances will automatically use the number of CPU's
#
OBS_WORKER_INSTANCES="0"

## Path:      Applications/OBS
## Description: define names of build instances for z/VM
## Type:      string
## Default:   ""
## Config:    OBS
#
# The names of the workers as defined in z/VM. These must have two minidisks
# assigned, and have a secondary console configured to the local machine:
# 0150 is the root device
# 0250 is the swap device
#
#OBS_WORKER_INSTANCE_NAMES="LINUX075 LINUX076 LINUX077"
OBS_WORKER_INSTANCE_NAMES=""

## Path:      Applications/OBS
## Description: The base directory, where sub directories for each worker will get
# created
## Type:      string
## Default:   ""
## Config:    OBS
#
#
OBS_WORKER_DIRECTORY=""

## Path:      Applications/OBS
## Description: The base for port numbers used by worker instances
## Type:      integer
## Default:   "0"
## Config:    OBS
#
# 0 means let the operating system assign a port number
#
OBS_WORKER_PORTBASE="0"

## Path:      Applications/OBS
## Description: Number of parallel compile jobs per worker
## Type:      integer
## Default:   "1"
## Config:    OBS
#
# this maps usually to "make -j1" during build
#
OBS_WORKER_JOBS="1"

```

```

## Path:      Applications/OBS
## Description: Run in test mode (build results will be ignore, no job blocking)
## Type:      ("yes" | "")
## Default:   ""
## Config:    OBS
#
OBS_WORKER_TEST_MODE=""

## Path:      Applications/OBS
## Description: define one or more labels for the build host.
## Type:      string
## Default:   ""
## Config:    OBS
#
# A label can be used to build specific packages only on dedicated hosts.
# For example for benchmarking.
#
OBS_WORKER_HOSTLABELS=""

## Path:      Applications/OBS
## Description: Register in SLP server
## Type:      ("yes" | "no")
## Default:   "yes"
## Config:    OBS
#
#
OBS_USE_SLP="yes"

## Path:      Applications/OBS
## Description: Use a common cache directory for downloaded packages
## Type:      string
## Default:   ""
## Config:    OBS
#
# Enable caching requires a given directory here. Be warned, content will be
# removed there !
#
OBS_CACHE_DIR=""

## Path:      Applications/OBS
## Description: Defines the package cache size
## Type:      size in MB
## Default:   ""
## Config:    OBS
#
# Set the size to 50% of the maximum usable size of this partition

```

```

#
OBS_CACHE_SIZE=""

## Path:      Applications/OBS
## Description: Defines the nice level of running workers
## Type:      integer
## Default:   18
## Config:    OBS
#
# Nicenesses range from -20 (most favorable scheduling) to 19 (least
# favorable).
# Default to 18 as some testsuites depend on being able to switch to
# one priority below (19) _and_ having changed the numeric level
# (so going from 19->19 makes them fail).
#
OBS_WORKER_NICE_LEVEL=18

## Path:      Applications/OBS
## Description: Set used VM type by worker
## Type:      ("auto" | "xen" | "kvm" | "lxc" | "zvm" | "emulator:$arch" | "emulator:
$arch:$script" | "none")
## Default:   "auto"
## Config:    OBS
#
#
OBS_VM_TYPE="auto"

## Path:      Applications/OBS
## Description: Set kernel used by worker (kvm)
## Type:      ("none" | "/boot/vmlinuz" | "/foo/bar/vmlinuz)
## Default:   "none"
## Config:    OBS
#
# For z/VM this is normally /boot/image
#
OBS_VM_KERNEL="none"

## Path:      Applications/OBS
## Description: Set initrd used by worker (kvm)
## Type:      ("none" | "/boot/initrd" | "/foo/bar/initrd-foo)
## Default:   "none"
## Config:    OBS
#
# for KVM, you have to create with (example for openSUSE 11.2):
#
# export rootfstype="ext4"

```



```

# mkinitrd -d /dev/null -m "ext4 binfmt_misc virtio_pci virtio_blk" -k
vmlinuz-2.6.31.12-0.2-default -i initrd-2.6.31.12-0.2-default-obs_worker
#
# a working initrd file which includes virtio and binfmt_misc for OBS in order to work
fine
#
# for z/VM, the build script will create a initrd at the given location if
# it does not yet exist.
#
OBS_VM_INITRD="none"

## Path:      Applications/OBS
## Description: Autoseup for XEN/KVM/TMPFS disk (root) - Filesize in MB
## Type:      integer
## Default:   "4096"
## Config:    OBS
#
#
OBS_VM_DISK_AUTOSETUP_ROOT_FILESIZE="4096"

## Path:      Applications/OBS
## Description: Autoseup for XEN/KVM disk (swap) - Filesize in MB
## Type:      integer
## Default:   "1024"
## Config:    OBS
#
#
OBS_VM_DISK_AUTOSETUP_SWAP_FILESIZE="1024"

## Path:      Applications/OBS
## Description: Filesystem to use for autoseup {none,ext4}=ext4, ext3=ext3
## Type:      string
## Default:   "ext3"
## Config:    OBS
#
#
OBS_VM_DISK_AUTOSETUP_FILESYSTEM="ext3"

## Path:      Applications/OBS
## Description: Filesystem mount options to use for autoseup
## Type:      string
## Default:   ""
## Config:    OBS
#
#
OBS_VM_DISK_AUTOSETUP_MOUNT_OPTIONS=""

```

```

## Path:      Applications/OBS
## Description: Enable build in memory
## Type:      ("yes" | "")
## Default:   ""
## Config:    OBS
#
# WARNING: this requires much memory!
#
OBS_VM_USE_TMPFS=""

## Path:      Applications/OBS
## Description: Memory allocated for each VM (512) if not set
## Type:      integer
## Default:   ""
## Config:    OBS
#
#
OBS_INSTANCE_MEMORY=""

## Path:      Applications/OBS
## Description: Enable storage auto configuration
## Type:      ("yes" | "")
## Default:   ""
## Config:    OBS
#
# WARNING: this may destroy data on your hard disk !
# This is usually only used on mass deployed worker instances
#
OBS_STORAGE_AUTOSETUP="yes"

## Path:      Applications/OBS
## Description: Setup LVM via obsstoragesetup
## Type:      ("take_all" | "use_obs_vg" | "none")
## Default:   "use_obs_vg"
## Config:    OBS
#
# take_all: WARNING: all LVM partitions will be used and all data erased !
# use_obs_vg: A lvm volume group named "OBS" will be re-setup for the workers.
#
OBS_SETUP_WORKER_PARTITIONS="use_obs_vg"

## Path:      Applications/OBS
## Description: Size in MB when creating LVM partition for cache partition
## Type:      integer
## Default:   ""
## Config:    OBS
#

```

```

#
OBS_WORKER_CACHE_SIZE=""

## Path:      Applications/OBS
## Description: Size in MB when creating LVM partition for each worker root partition
## Type:      integer
## Default:   ""
## Config:    OBS
#
#
OBS_WORKER_ROOT_SIZE=""

## Path:      Applications/OBS
## Description: Size in MB when creating LVM partition for each worker swap partition
## Type:      integer
## Default:   ""
## Config:    OBS
#
#
OBS_WORKER_SWAP_SIZE=""

## Path:      Applications/OBS
## Description: URL to a proxy service for caching binaries used by worker
## Type:      string
## Default:   ""
## Config:    OBS
#
#
OBS_WORKER_BINARIES_PROXY=""

## Path:      Applications/OBS
## Description: URL to a ssh pub key to allow root user login
## Type:      string
## Default:   ""
## Config:    OBS
#
# This is usually used on mass (PXE) deployed workers)
#
OBS_ROOT_SSHD_KEY_URL=""

## Path:      Applications/OBS
## Description: URL to a script to be downloaded and executed
## Type:      string
## Default:   ""
## Config:    OBS
#
# This is a hook for doing special things in your setup at boot time

```

```
#  
OBS_WORKER_SCRIPT_URL=""
```

2.1.2.2 BConfig.pm

This file is a perl module used by most back-end scripts, it mainly defines global variables. Since it is a perl module, after changes the back-end servers need to be restarted to become aware of the changes.



Warning

If there is a Perl syntax error in this file, the services will not start. Most likely you forgot the semicolon on the end of a statement.

TABLE 2.5: BConfig.pm VARIABLES

Variable	Description	Values <u>default</u>	Remarks
\$hostname	FQDN of the back-end host		leave as it is
\$ip	IP address of the back-end host		leave as it is
\$frontend	FQDN of the front-end host	<u>undef</u>	set only if the front-end runs on another host
\$ipaccess	Map of IP access rules		Add all hosts if partition are used
\$srcserver	URL of the source server	<u>'http://\$hostname: 5352'</u>	
\$reposerver	URL of the repo server	<u>'http://\$hostname: 5252'</u>	partition specific
\$serviceserver	URL of the service server	<u>'http://\$hostname: 5152'</u>	

Variable	Description	Values <u>default</u>	Remarks
\$workersrcserver	URL of the source server		optional for worker access
\$workerreposer	URL of the repo server		optional for worker access
\$servicedir	Path to the service scripts	<u>/usr/lib/obs/service/</u>	
\$servicetempdir	Path to service temp dir	<u>/var/tmp/</u>	optional
\$serviceroot	Prefix to servicedir		optional
\$service_maxchild	Maximum number of concurrent jobs for source service	integer	unlimited if not set
\$gpg_standard_key	Path to the standard sign key		
\$hermesserver	URL of the notification server		optional
\$hermesnamespace	Namespace for the notifications		optional
\$notification_plugin	notification plugins		optional
@reposervers	List of reposervers	<u>("http://\$hostname: 5252")</u>	
\$bsdir	Path to the back-end directory	<u>/srv/obs</u>	
\$bsuser	OS user running the back-end	<u>obsrun</u>	

Variable	Description	Values <u>default</u>	Remarks
\$bsgroup	OS group running the back-end	<u>obsrun</u>	
\$bsquotafile	Package quota for projects		optional
\$sched_asyncmode	Use asynchronous scheduler		Avoid issues with remote projects on slow networks
\$sched_startupmode	Cold start mode	<u>0 1 2</u>	
\$disable_data_sync	fdatsync		may cause data corruption
\$rundir	back-end communication	<u>\$bsdir/run</u>	
\$logdir	log directory	<u>\$bsdir/log</u>	
\$nosharedtrees	Shared trees 0 = shared 1 = not shared 2 = not shared with fallback	<u>0 1 2</u>	optional for non-ACL systems, should be set for access control
\$packtrack	enable binary release tracking	<u>[]</u>	
\$limit_projects	limit visibility of projects for some architectures		optional
\$relsync_pool	allow separation of releasenumbersyncing per architecture		
\$stageserver	stage server		rsync URI

Variable	Description	Values <u>default</u>	Remarks
\$stageserver_sync	Extra stage sync server		rsync URI
\$sign	Path to sign script		
\$sign_project	call sign with --project <project>	0 <u>1</u>	
\$keyfile	Global sign key		
\$localarch	Local architecture for product building		
\$buildlog_maxsize	worker max buildlog size	<u>'500 * 1000000'</u>	in bytes
\$buildlog_maxidle	Time with no changes in the buildlog will kill the job	<u>'8 * 3600'</u>	in sec
\$xenstore_maxsize	xenstore size	<u>'20 * 1000000'</u>	current XEN has no xenstore anymore
\$gettimeout	Max timeout for get	<u>'1 * 3600'</u>	in sec
\$workerhostcheck	check script for worker		
\$powerhosts	Worker with more resources		obsolete use constraints
\$powerpkgs	packages which need workers with more resources		obsolete use constraints
\$norootexceptions	List of packages need to build as root		

Variable	Description	Values <u>default</u>	Remarks
\$old_style_services	Use old style source service handling	<u>0</u> 1	
\$partition	Current partition		see <i>Section 1.4, "Distributed Setup"</i>
\$partitioning	Partition project mapping		see <i>Section 1.4, "Distributed Setup"</i>
\$partitionservers	Partition server mapping		see <i>Section 1.4, "Distributed Setup"</i>
\$dispatch_adjust	Adjust dispatch priority		see <i>Section 3.4.2, "dispatch_adjust Array"</i>
\$publishedhook_use_regex	Use regular expressions in publish hook map	<u>0</u> 1	see <i>Section 3.5, "Publisher Hooks"</i>
\$publishedhook	Publish hook map		see <i>Section 3.5, "Publisher Hooks"</i>
\$unpublishedhook_use_regex	Use regular expressions in unpublish hook map	<u>0</u> 1	see <i>Section 3.6, "Unpublisher Hooks"</i>
\$unpublishedhook	Unpublish hook map		see <i>Section 3.6, "Unpublisher Hooks"</i>

Example BSConfig.pm

```
#
# Copyright (c) 2006, 2007 Michael Schroeder, Novell Inc.
#
# This program is free software; you can redistribute it and/or modify
# it under the terms of the GNU General Public License version 2 as
# published by the Free Software Foundation.
#
```



```

# This program is distributed in the hope that it will be useful,
# but WITHOUT ANY WARRANTY; without even the implied warranty of
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
# GNU General Public License for more details.
#
# You should have received a copy of the GNU General Public License
# along with this program (see the file COPYING); if not, write to the
# Free Software Foundation, Inc.,
# 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA
#
#####
#
# Open Build Service Configuration
#

package BSConfig;

use Net::Domain;
use Socket;

my $hostname = Net::Domain::hostfqdn() || 'localhost';
# IP corresponding to hostname (only used for $ipaccess); fallback to localhost since
# inet_aton may fail to resolve at shutdown.
my $ip = quotemeta inet_ntoa(inet_aton($hostname) || inet_aton("localhost"));

my $frontend = undef; # FQDN of the Web UI/API server if it's not $hostname

# If defined, restrict access to the backend servers (bs_repserver, bs_srcserver,
# bs_service)
our $ipaccess = {
    '127\.*' => 'rw', # only the localhost can write to the backend
    "^$ip" => 'rw',   # Permit IP of FQDN
    '.*' => 'worker', # build results can be delivered from any client in the network
};

# IP of the Web UI/API Server (only used for $ipaccess)
if ($frontend) {
    my $frontendip = quotemeta inet_ntoa(inet_aton($frontend) || inet_aton("localhost"));
    $ipaccess->{$frontendip} = 'rw'; # in dotted.quad format
}

# Change also the SLP reg files in /etc/slp.reg.d/ when you touch hostname or port
our $srcserver = "http://$hostname:5352";
our $reposerver = "http://$hostname:5252";
our $serviceserver = "http://$hostname:5152";

# you can use different ports for worker connections

```

```

#our $workersrcserver = "http://$hostname:5353";
#our $workerreposever = "http://$hostname:5253";

our $servicedir = "/usr/lib/obs/service/";
#our $servicetempdir = "/var/temp/";
#our $serviceroot = "/opt/obs/MyServiceSystem";

# Maximum number of concurrent jobs for source service
#our $service_maxchild = 20;

our $gpg_standard_key = "/srv/obs/obs-default-gpg.asc";
# optional notification service:
#our $hermesserver = "http://$hostname/hermes";
#our $hermesnamespace = "OBS";
#
# Notification Plugin, multiple plugins supported, separated by space
#our $notification_plugin = "notify_hermes notify_rabbitmq";
#

# For the workers only, it is possible to define multiple repository servers here.
# But only one source server is possible yet.
our @reposervers = ("http://$hostname:5252");

# Package defaults
our $bsdir = '/srv/obs';
our $bsuser = 'obsrun';
our $bsgroup = 'obsrun';
#our $bsquotafile = '/srv/obs/quota.xml';

# Use asynchronous scheduler. This avoids hanging schedulers on remote projects,
# when the network is slow or broken. This will become the default in future
# our $sched_asyncmode = 1;

# Define how the scheduler does a cold start. The default (0) is to request the
# data for all packages, (1) means that only the non-remote packages are fetched,
# (2) means that all of the package data fetches get delayed.
# our $sched_startupmode = 0;

# Disable fdatsync calls, increases the speed, but may lead to data
# corruption on system crash when the filesystem does not guarantees
# data write before rename.
# It is esp. required on XFS filesystem.
# It is safe to be disabled on ext4 and btrfs filesystems.
#our $disable_data_sync = 1;

# Package rc script / backend communication + log files
our $rundir = "$bsdir/run";

```

```

our $logdir = "$bsdir/log";

# optional for non-acl systems, should be set for access control
# 0: trees are shared between projects (built-in default)
# 1: trees are not shared (only usable for new installations)
# 2: new trees are not shared, in case of a missing tree the shared
#    location is also tried (package default)
our $nosharedtrees = 2;

# enable binary release tracking by default for release projects
our $packtrack = [];

# optional: limit visibility of projects for some architectures
#our $limit_projects = {
# "ppc" => [ "openSUSE:Factory", "FATE" ],
# "ppc64" => [ "openSUSE:Factory", "FATE" ],
#};

# optional: allow separation of releasnumber syncing per architecture
# one counter pool for all ppc architectures, one for i586/x86_64,
# arm archs are separated and one for the rest in this example
our $relysync_pool = {
  "local" => "local",
  "i586" => "i586",
  "x86_64" => "i586",
  "ppc" => "ppc",
  "ppc64" => "ppc",
  "ppc64le" => "ppc",
  "mips" => "mips",
  "mips64" => "mips",
  "mipsel" => "mipsel",
  "mips64el" => "mipsel",
  "aarch64" => "arm",
  "aarch64_ilp32" => "arm",
  "armv4l" => "arm",
  "armv5l" => "arm",
  "armv6l" => "arm",
  "armv6hl" => "arm",
  "armv7l" => "arm",
  "armv7hl" => "arm",
  "armv5el" => "armv5el", # they do not exist
  "armv6el" => "armv6el",
  "armv7el" => "armv7el",
  "armv8el" => "armv8el",
  "sparcv9" => "sparcv9",
  "sparc64" => "sparcv9",
};

```

```

#No extra stage server sync
#our $stageserver = 'rsync://127.0.0.1/put-repos-main';
#our $stageserver_sync = 'rsync://127.0.0.1/trigger-repos-sync';

#No package signing server
our $sign = "/usr/bin/sign";
#Extend sign call with project name as argument "--project $NAME"
#our $sign_project = 1;
#Global sign key
our $keyfile = "/srv/obs/obs-default-gpg.asc";

# Use a special local arch for product building
# our $localarch = "x86_64";

# config options for the bs_worker
#
#our buildlog_maxsize = 500 * 1000000;
#our buildlog_maxidle = 8 * 3600;
#our xenstore_maxsize = 20 * 1000000;
#our gettimeout = 1 * 3600;
#
# run a script to check if the worker is good enough for the job
#our workerhostcheck = 'my_check_script';
#
# Allow to build as root, exceptions per package
# the keys are actually anchored regexes
# our $norootexceptions = { "my_project/my_package" => 1, "openSUSE:Factory.*/
installation-images" => 1 };

# Use old style source service handling
# our $old_style_services = 1;

###
# Optional support to split the binary backend. This can be used on large servers
# to separate projects for better scalability.
# There is still just one source server, but there can be multiple servers which
# run each repserver, schedulers, dispatcher, warden and publisher
#
# This repo service is the 'home' server for all home:* projects. This and the
# $reposerver setting must be different on the binary backend servers.
# our $partition = 'home';
#
# this defines how the projects are split. All home: projects are hosted
# on an own server in this example. Order is important.
# our $partitioning = [ 'home:' => 'home',
#                       '.*' => 'main',

```

```

#           ];
#
# our $partitionsservers = { 'home' => 'http://home-backend-server:5252',
#                           'main' => 'http://main-backend-server:5252',
#                           };
#
# Publish hooks
our $publishedhook_use_regex = 1;
our $publishedhook = {
    "Product\SLES12"      => "/usr/local/bin/script2run_sles12",
    "Product\SLES11.*"   => "/usr/local/bin/script2run_sles11",
};

# host specific configs
my $hostconfig = __FILE__;
$hostconfig =~ s/[^\/]*$/bsconfig.$hostname/;
if (-r $hostconfig) {
    print STDERR "reading $hostconfig...\n";
    require $hostconfig;
}

1;

```

2.2 Log Files

2.2.1 Front-end

The front-end log files are found under */srv/www/obs/api/log*.

The following front-end log files exist:

- *apache_access.log* - apache requests
- *apache_error.log* - errors from apache
- *backend_access.log* - API → backend requests
- *clockworkd.clock.output* → timer event log
- *delayed_job.log* → delayed job log
- *production.log* → main ruby log

- production.searchd.log - search daemon log
- production.searchd.query.log - search request logs

2.2.2 Back-end

The back-end log files are found by default under `/srv/obs/log/`.

The following back-end log files exist:

- dispatcher.log - dispatcher log
- dodup.log - download on demand log (since 2.7)
- publisher.log - publisher log
- rep_server.log - repo server log
- scheduler_<arch>.log - scheduler log for each architecture
- signer.log - sign service log
- src_server.log - source server log
- src_service.log - source service daemon log
- warden.log - warden log

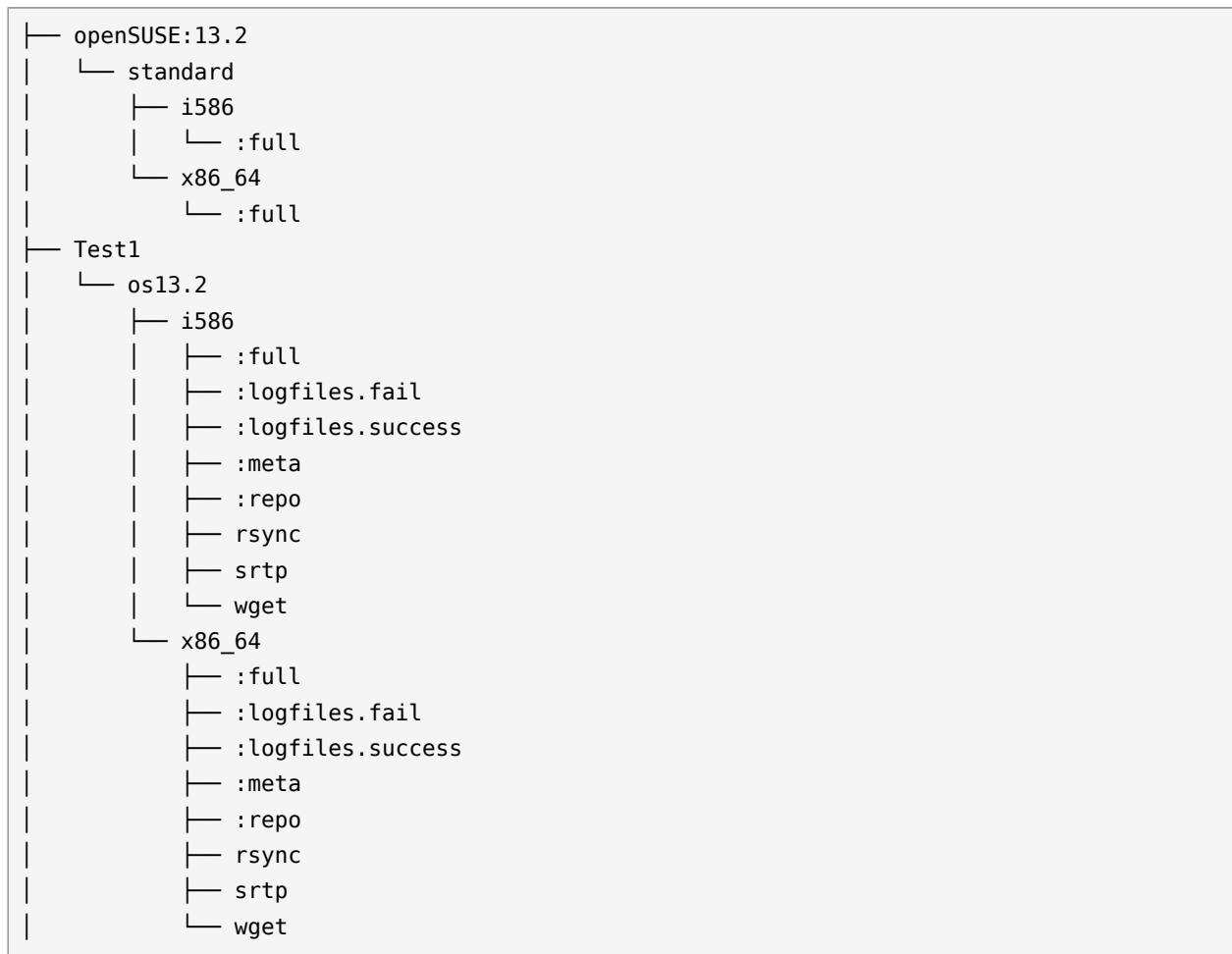
2.3 /srv/obs Tree

The default back-end data directory is located under `/srv/obs/`. Here are a bunch of subdirectories used for communication between the different server, to store data, status information and logs. Here is one file ***configuration.xml*** in the top directory, which stores the global OBS configuration for the back-end. You should not modify this file directly, but use the API `/configuration` interface instead, since this information needs to be kept in sync with the front-end.

2.3.1 build Directory

In this subdirectory managed by the repo server daemon, all repository data, meta data and build results are stored in a hierarchical tree.

Example build directory tree of a binary imported distribution (OpenSUSE:13.2) and a small test project with 3 packages:



2.3.2 db Directory

Back-end database root directory use by the source server, repo server scheduler and publisher. Nobody should touch this.

2.3.3 diffcache Directory

Cache for source server compare operations.

2.3.4 events Directory

Communication between services.

2.3.5 info Directory

Scheduler information managed by the scheduler and used by the repo server.

2.3.6 jobs Directory

The build jobs are stored in the `/srv/obs/jobs` directory. They are organized by build architecture:

```
jobs
├── armv7l
├── i586
├── load
└── x86_64
    └── Release:Stable::SLE-12_GA::CI-demo-36db80552b735e193dced13f058f866f
```

The `jobs/load` file contains statistical data about the build jobs.

2.3.7 log Directory

Contains the log files of the back-end daemons.

2.3.8 projects Directory

Contains the project hierarchy and meta data under revision control.

2.3.9 remotecache Directory

Cache for remote repository information.

2.3.10 repos Directory

Directory managed by the publisher to collect build results, also used by the repo server and scheduler to find build results.

2.3.11 repos_sync Directory

Directory with files pointing to the project root directories, helper for publisher rsync.

2.3.12 run Directory

State and lock information for the back-end daemons

2.3.13 sources Directory

All package sources under revision control in one directory per package, managed by the source server. Package sources are by default deduplicated across all projects, as long a source file has the same MD5 sum, it is only stored once. A pseudo '*project*' package exist in the directory containing the project meta data revisions. '*service*' and '*upload*' are temporary directories used by the source server.

Example sources directory structure:

```
sources/  
├─ CI-demo  
[...]  
├─ srtp  
├─ test1  
├─ _project  
├─ :service  
└─ :upload
```

2.3.14 trees Directory

Revision control data for project and packages, managed by the source server.

2.3.15 upload Directory

Temporary directory for uploading files for other back-end components.

2.3.16 workers Directory

Worker information

2.4 Metadata

2.4.1 OBS Revision Control

This section gives a short generic overview how the revision information are stored in the OBS back-end for packages and projects. The OBS back-end stores all files in a light weight content based hierarchical tree. Each file is hashed (with MD5) and stored with the hash as part of the filename under the `/srv/obs/tree` or `/srv/obs/sources` directories. The revision information is stored in separate files by the Source Server in the `/srv/obs/projects` directory.

2.4.1.1 OBS revision control files

The revision information is stored in simple CSV like file format with a bar (|) as delimiter between the 8 columns. The files do have the extension `.rev` for package/project revision data and `.mref` for meta revision data. The hash then points to a `<hash>-MD5SUMS` file in the `/srv/obs/tree/` directories which have the file list with MD5 hashes of this revision. The hashes in this file list are pointing to the source files in the `/srv/obs/sources` tree.

An example revision file:

```
1|1|56cdd3adb778089d1fcc49b92bb93e5b|0.9|1464005086|user4|initial version|
2|2|fe7aa1ade5c9d005de738c234c90bc90|0.9|1464005304|user4|fix spec file|
3|1|72c7986e694f45ab1a62779e64e92a8f|1.0|1464005339|user4|new version|
4|2|699e9931e6f167d78e65bbe5853f592f|1.0|1464006221|user4|add patch file|
5|1|0cfc3a2297f38d2aa9d8d0e98fc22a38|1.1|1464007797|user4|new version|
```

TABLE 2.6: THE 8 COLUMNS

Column	Content	XML tag	may empty
1	revision number	ref	no
2	version revision number	vref	yes
3	hash	srcmd5	no
4	version	version	yes
5	time stamp	time	no

Column	Content	XML tag	may empty
6	user	user	no
7	commit message	comment	yes
8	request id	requestid	yes

Depending on the target (package, project or meta data) used, fields can be empty or have special values, for example, unknown for the version.

Example MD5SUMS file

```
/srv/obs # cat trees/Test1/package1/56cdd3adb778089d1fcc49b92bb93e5b-MD5SUMS
0a17daaa913df9e50ee65e83a1898363 package1.spec
1f810b3521242a98333b7bbf6b2b7ef7 test1.sh
```

2.4.1.2 OBS Revision API

The revision info can be retrieved via API calls for the specific package, for example, using `/source/<project>/<package>/_history`.

Specific revisions of files can be retrieved with the optional "rev=N" parameter, for example, `/source/<project>/<package>/<file>?rev=N`.

On PUT and POST methods for files the optional "comment=some+comment" can be used to set a commit message.

2.4.2 Project Metadata

Project metadata are XML files containing the meta project information, such as title, description, related user and groups with roles, build settings, repository settings, publish settings, debug settings and more.

TABLE 2.7: PROJECT META XML

XML tag	Attributes	Content
project	name	project name
title		Short description

XML tag	Attributes	Content
description		Developer information
person	userid	login name
person	role	role (maintainer, bugowner, ...)
group	groupid	group name
group	role	role (maintainer, bugowner, ...)
devel		An optional devel project
build		optional build flags
publish		optional publish flags
useforbuild		optional useforbuild flags
debuginfo		optional debuginfo flags
binarydownload		optional binarydownload flags
repository	name	name of the repository for build results
repository path	project	name of the source project for remaining build requires
repository path	repository	name of repository in the source project
repository arch		architecture name
remoteurl		path to a remote OBS API for interconnect

Example project metadata:

```
<project name="Test11">
  <title>Test project 11</title>
  <description>Project for demo</description>
  <person userid="Admin" role="maintainer"/>
  <person userid="user0" role="maintainer"/>
  <group groupid="obsprj3" role="maintainer"/>
```

```
<repository name="openSUSE_13.2">
  <path project="openSUSE.org:openSUSE:13.2" repository="standard"/>
  <arch>x86_64</arch>
</repository>
</project>
```

2.4.3 Package Metadata

XML file about package meta information, like Title, description, related user and groups with roles, build settings, publish settings, debug settings and more. Most XML tags are the same as for projects.

Example package meta data:

```
<package name="test1" project="Test11">
  <title>A test package for learning</title>
  <description>An example test package for learning.&#13;
</description>
  <person userid="user5" role="bugowner"/>
  <person userid="user5" role="maintainer"/>
  <build>
    <enable repository="openSUSE_13.2"/>
  </build>
  <publish>
    <disable repository="openSUSE_13.2"/>
  </publish>
  <debuginfo>
    <disable/>
  </debuginfo>
</package>
```

2.4.4 Attribute Metadata

Attributes can be used to add special information to packages. Attributes can be used to trigger special actions.

Example attribute data:

```
<attributes>
  <attribute name="Issues" namespace="OBS"/>
  <attribute name="AutoCleanup" namespace="OBS">
    <value>2016-06-30 00:00:00</value>
  </attribute>
```

```
<attribute name="AutoCleanup" namespace="OBS">
  <value></value>
</attribute>
</attributes>
```

2.4.5 Job Files

Jobs are stored by the scheduler in the `/srv/obs/jobs` directory and contain the build setup information for the package, for example, a reference to the exact source version, build dependencies, build repository information, timestamps.

Sample job file:

```
<buildinfo project="Release:Stable" repository="SLE-12_GA" package="CI-demo"
srcserver="http://obs.b1-systems.de:5352"
reposer="http://obs.b1-systems.de:5252">
  <job>Release:Stable::SLE-12_GA::
CI-demo-36db80552b735e193dced13f058f866f</job>
  <arch>x86_64</arch>
  <srcmd5>36db80552b735e193dced13f058f866f</srcmd5>
  <verifymd5>36db80552b735e193dced13f058f866f</verifymd5>
  <rev>2</rev>
  <disturl>obs://b1-systems.de/Release:Stable/SLE-12_GA/
36db80552b735e193dced13f058f866f-CI-demo</disturl>
  <reason>new build</reason>
  <needed>0</needed>
  <revtime>1461077600</revtime>
  <readytime>1461077708</readytime>
  <file>CI-demo.spec</file>
  <versrel>0.1.9-2</versrel>
  <bcnt>1</bcnt>
  <release>2.1</release>
  <debuginfo>1</debuginfo>
  <prjconfconstraint>linux:version:min 3.0.0</prjconfconstraint>
  <bdep name="aaa_base" preinstall="1" runscripts="1" notmeta="1" />
  <bdep name="attr" preinstall="1" notmeta="1" />
  <bdep name="bash" preinstall="1" notmeta="1" />
  <bdep name="coreutils" preinstall="1" notmeta="1" />
  <bdep name="diffutils" preinstall="1" notmeta="1" />
  <bdep name="filesystem" preinstall="1" notmeta="1" />
  <bdep name="fillup" preinstall="1" notmeta="1" />
  <bdep name="glibc" preinstall="1" notmeta="1" />
  <bdep name="grep" preinstall="1" notmeta="1" />
  <bdep name="libbz2-1" preinstall="1" notmeta="1" />
  <bdep name="libgcc_s1" preinstall="1" notmeta="1" />
```

```
<bdep name="m4" preinstall="1" notmeta="1" />
[...]  
<path project="Release:Stable" repository="SLE-12_GA"  
server="http://obs.b1-systems.de:5252" />  
<path project="SUSE:SLE-12:GA" repository="standard"  
server="http://obs.b1-systems.de:5252" />  
</buildinfo>
```

3 Administration

3.1 Tools

3.1.1 `obs_admin`

`obs_admin` is a command-line tool used on the back-end server(s) to manage running services, submit maintenance tasks, and debug problems. It should be only used by experienced admins.

It has built-in help which you can display with `obs_admin --help`.

Options to control the running services:

```
Job Controlling
=====

--shutdown-scheduler <architecture>
  Stops the scheduler nicely with dumping out its current state
  for fast startup.

--check-project <project> <architecture>
--check-project <project> <repository> <architecture>
--check-all-projects <architecture>
  Check status of a project and its repositories again

--deep-check-project <project> <architecture>
--deep-check-project <project> <repository> <architecture>
  Check status of a project and its repositories again
  This deep check includes also the sources, in case of lost events.

--check-package <project> <package> <architecture>
  Check status of a package in all repositories

--publish-repository <project> <repository>
  Creates an event for the publisher. The scheduler is NOT scanning for new packages.
  The publisher may skip the event, if nothing has changed.
  Use --republish-repository when you want to enforce a publish.

--unpublish-repository <project> <repository>
  Removes the prepared :repo collection and let the publisher remove the result. This
  is also updating the search database.
  WARNING: this works also for locked projects!
```



```

--prefer-publish-event <name>
  prefers a publish event to be next. <name> is the file name inside of the publish
  event directory.

--republish-repository <project> <repository>
  enforce to publish a repository

--rebuild-full-tree <project> <repository> <arch>
  rebuild the content of :full/ directory

--clone-repository <source project> <source repository> <destination repository>
--clone-repository <source project> <source repository> <destination project>
<destination repository>
  Clone an existing repo into another existing repository.
  Usefull for creating snapshots.

--rescan-repository <project> <repository> <architecture>
  Asks the scheduler to scan a repository for new packages and add
  them to the cache file.

--force-check-project <project> <repository> <architecture>
  Enforces the check of an repository, even when it is currently blocked due to amount
  of
  calculating time.

--create-patchinfo-from-updateinfo
  creates a patchinfo submission based on an updateinfo information.

```

Options for maintenance are:

Maintenance Tasks

=====

Note: the --update-*-db calls are usually only needed when corrupt data has been created, for example after a file system corruption.

```

--update-source-db [<project>]
  Update the index for all source files.

```

```

--update-request-db
  Updates the index for all requests.

```

```

--remove-old-sources <days> <y> (--debug)
  WARNING: this is an experimental feature atm. It may trash your data, but you have
  anyway
  a backup, right?

```

```
remove sources older than <x> days, but keep <y> number of revisions
--debug for debug output
```

Options for debugging:

Debug Options

=====

```
--dump-cache <project> <repository> <architecture>
  Dumps out the content of a binary cache file.
  This shows all the content of a repository, including all provides
  and requires.

--dump-state <architecture>

--dump-project-from-state <project> <arch>
  dump the state of a project.

--dump-relsync <file>
  To dump content of :relsync files.

--set-relsync <file> <key> <value>
  Modify key content in a a :relsync file.

--check-meta-xml <project>
--check-meta-xml <project> <package>
  Is parsing a project or package xml file and puts out error messages, in case of
  errors.

--check-product-xml <file>
  Is parsing a product xml file and puts out error messages, in case of errors.
  It does expand all xi:include references and validates the result.

--check-product-group-xml <file>
  Is parsing a group xml file from a product definition and puts out error messages, in
  case of errors.

--check-kiwi-xml <file>
--check-kiwi-xml <project> <package>
  Is parsing a KIWI xml file and puts out error messages, in case of errors.

--check-constraints <file>
--check-constraints <project> <package>
  Validates a _constraints file

--check-pattern-xml <file>
  Is parsing a pattern xml file and puts out error messages, in case of errors.
```

```
--check-request-xml <file>
  Is parsing a request xml file and puts out error messages, in case of errors.

--parse-build-desc <file> [<arch> [<buildconfigfile>]]
  Parse a spec, dsc or KIWI file with the Build script parser.

--show-scheduler-architectures
  Show all architectures which are configured in configuration.xml to be supported by
  this instance.

--show-delta-file <file>
  Show all instructions of a OBS delta file

--show-delta-store <file>
  Show delta store statistics
```

3.1.2 **osc**

The **osc** command-line client is mainly used by developers and packagers. But for some tasks, admin people also need this tool. It too has builtin help: use `osc --help`. The tool needs to be configured first to know the OBS API URL and your user details.

To configure the **osc** tool the first time you need to call it with

```
osc -A <URL to the OBS API>
For example:
osc -A https://api.testobs.org
```

Follow the instructions on the terminal.



Warning

The password is stored in clear text in the `.oscr` file by default, so you need to give this file restrictive access rights, only read/write access for your user should be allowed. **osc** allows to store the password in other ways (in keyrings for example) and may use different methods for authentication like Kerberos see [Section 3.7.5.2, "Kerberos"](#)

For the admins the most important **osc** subcommands are:

- `meta` - to create or update projects or package data
- `API` - to read and write online configuration data

3.1.2.1 **osc meta** Subcommand

meta: Show meta information, or edit it

Show or edit build service metadata of type <prj|pkg|prjconf|user|pattern>.

This command displays metadata on buildservice objects like projects, packages, or users. The type of metadata is specified by the word after "meta", like e.g. "meta prj".

prj denotes metadata of a buildservice project.

prjconf denotes the (build) configuration of a project.

pkg denotes metadata of a buildservice package.

user denotes the metadata of a user.

pattern denotes installation patterns defined for a project.

To list patterns, use 'osc meta pattern PRJ'. An additional argument will be the pattern file to view or edit.

With the --edit switch, the metadata can be edited. Per default, osc opens the program specified by the environmental variable EDITOR with a temporary file. Alternatively, content to be saved can be supplied via the --file switch. If the argument is '-', input is taken from stdin:
osc meta prjconf home:user | sed ... | osc meta prjconf home:user -F -

For meta prj and prjconf updates optional commit messages can be applied with --message.

When trying to edit a non-existing resource, it is created implicitly.

Examples:

```
osc meta prj PRJ
osc meta pkg PRJ PKG
osc meta pkg PRJ PKG -e
```

Usage:

```
osc meta <prj|prjconf> [-r|--revision REV] ARGS...
osc meta <prj|pkg|prjconf|user|pattern> ARGS...
osc meta <prj|pkg|prjconf|user|pattern> [-m|--message TEXT] -e|--edit
  ARGS...
osc meta <prj|pkg|prjconf|user|pattern> [-m|--message TEXT] -F|--file
  ARGS...
osc meta pattern --delete PRJ PATTERN
osc meta attribute PRJ [PKG [SUBPACKAGE]] [--attribute ATTRIBUTE]
  [--create|--delete|--set [value_list]]
```

Options:

```

-h, --help          show this help message and exit
--delete           delete a pattern or attribute
-s ATTRIBUTE_VALUES, --set=ATTRIBUTE_VALUES
                  set attribute values
-R, --remove-linking-repositories
                  Try to remove also all repositories building against
                  remove ones.
-c, --create       create attribute without values
-e, --edit         edit metadata
-m TEXT, --message=TEXT
                  specify log message TEXT. For prj and prjconf meta
                  only
-r REV, --revision=REV
                  checkout given revision instead of head revision.

For
                  prj and prjconf meta only
-F FILE, --file=FILE
                  read metadata from FILE, instead of opening an
editor.
                  '-' denotes standard input.
-f, --force       force the save operation, allows one to ignores some
                  errors like depending repositories. For prj meta
only.
--attribute-project
                  include project values, if missing in packages
--attribute-defaults
                  include defined attribute defaults
-a ATTRIBUTE, --attribute=ATTRIBUTE
                  affect only a given attribute

```

3.1.2.2 **osc api** Subcommand

api: Issue an arbitrary request to the API

Useful for testing.

URL can be specified either partially (only the path component), or fully with URL scheme and hostname ('http://...').

Note the global -A and -H options (see osc help).

Examples:

```

osc api /source/home:user
osc api -X PUT -T /etc/fstab source/home:user/test5/myfstab
osc api -e /configuration

```

Usage:

```
osc api URL
```

Options:

```
-h, --help          show this help message and exit
-a NAME STRING, --add-header=NAME STRING
                    add the specified header to the request
-T FILE, -f FILE, --file=FILE
                    specify filename to upload, uses PUT mode by default
-d STRING, --data=STRING
                    specify string data for e.g. POST
-e, --edit          GET, edit and PUT the location
-X HTTP_METHOD, -m HTTP_METHOD, --method=HTTP_METHOD
                    specify HTTP method to use (GET|PUT|DELETE|POST)
```

The online API documentation is available at <https://build.opensuse.org/apidocs> ↗

Some examples for admin stuff:

```
# Read the global configuration file
osc api /configuration
# Update the global configuration
osc api /configuration -T /tmp/configuration.xml

# Read the distributions list
osc api /distributions
# Update the distributions list
osc api /distributions -T /tmp/distributions.xml

# retrieve statistics
osc api /statistics/latest_added
```

3.2 Managing Build Targets

3.2.1 Interconnect

Using another Open Build Service as source for build targets is the easiest way to start. The advantage is, that you save local resources and you do not need to build everything from scratch. The disadvantage is that you depend on the remote instance, if it has a downtime your instance cannot do any builds for these targets, if the remote admins decide to remove some targets you cannot use them anymore.

The easiest way to interconnect with some of the public OBS instances is to use the Web UI. You need to log in with an administrator account of your instance to do this. On the start page of an administrator account you will find a **Configuration** link. On the Configuration page you find an Interconnect tab on the top, use this and select the public side you want.

If you want to connect to a not listed instance, you can simple create a remote project using the `osc meta prj` command. A remote project differs from a local project the it has a **remoteurl** tag (see [Section 2.4.2, "Project Metadata"](#)).

Example:

```
<project name="openSUSE.org">
  <title>openSUSE.org Project Link</title>
  <description>
This project refers to projects hosted on the openSUSE Build Service
</description>
  <remoteurl>https://api.opensuse.org/public</remoteurl>
</project>
```

Sending this via `osc` to the server:

```
osc meta prj -m "add openSUSE.org remote" -F /tmp/openSUSE.org.prj
```

3.2.2 Importing Distributions

With local hosted distributions packages you are independent from other parties. On sides with no or bad internet connections, this is the only way to go. You do not need to build the distribution packages on your instance, you can use binary packages for this. Here are different ways to get a local build repository:

1. mirror a distribution from another OBS instance
2. mirror a binary distribution from a public mirror and import the binaries
3. use already existing local install repositories (for example, from an SMT instance)
4. use the install media to import the binaries

These tasks need to be run on the obs back-end. In a partition setup you need to run it on the partition which would the owner for the project.

3.2.2.1 Mirroring from a Remote OBS Instance

Mirroring a project from a remote OBS instance can be done with the **obs_mirror_project** script which is supplied with the obs sources and via the obs-utils package. You can get the latest version from GitHub: https://raw.githubusercontent.com/openSUSE/open-build-service/master/dist/obs_mirror_project.

The usage:

```
Usage: obs_mirror_project.rb -p PROJECT -r REPOSITORY
                               [-a ARCHITECTURE] [-d DESTINATION] [-A APIURL] [-t] [-v]

Example: (mirror openSUSE 13.1 as base distro)
obs_mirror_project -p openSUSE:13.1 -r standard -a i586,x86_64

Options help:
  -p, --proj PROJECT           Project Name: eg. openSUSE:13.1,Ubuntu:14.04,etc.
  -r, --repo REPOSITORY       Repository Name:  eg. standard,qemu,etc.
  -a, --arch Architecture     Architecture Name: eg. i586,x86_64,etc.
  -d, --dest DESTINATION      Destination Path: eg. /obs
                               Default: PWD (current working directory)
  -A, --api APIURL            OSC API URL :Default: https://api.opensuse.org
  -t, --trialrun              Trial run: not executing actions
  -v, --verbose               Verbose
  -h, --help                  Display this screen
```

3.2.2.2 Importing Binary Packages

This is the same procedure for all local sources. If you have a local copy of a distribution, you can either use symbolic links to the binary packages or copy them in a directory on the back-end repo server under the `/srv/obs/build` directory. You should follow the common name schema for build repository here. As first step you should create an empty project for the distribution, you can use the Web UI or the **osc** command-line tool. Then you add a repository with the name `standard` and the build architectures you want. Here an example project meta file:

```
<project name="SUSE:13.2">
  <title>openSUSE 13.2 build repositories</title>
  <description>openSUSE 13.2 build repositories</description>
  <person userid="Admin" role="maintainer"/>
  <build>
    <disable repository="standard"/>
  </build>
</publish>
```



```

<disable/>
</publish>
<repository name="standard">
  <arch>x86_64</arch>
  <arch>i586</arch>
</repository>
</project>

```

After you have created the project with these settings, the `/srv/obs/build` directory should have a tree for SUSE:13.2:

```

/srv/obs/
├── build
│   └── SUSE:13.2
│       ├── standard
│       │   ├── i586
│       │   │   ├── :bininfo
│       │   │   └── :schedulerstate
│       │   └── x86_64
│       │       ├── :bininfo
│       │       └── :schedulerstate

```



Warning

All the directories under `/srv/obs/build` have to be owned by the **obsrun** user and group. The **obsrun** user need write access to them. **If not the scheduler process will crash on your instance.**

You need to import the project configuration as well, you can get them for example from the openSUSE Build Service.

```

osc -A https://api.opensuse.org meta prjconf openSUSE:13.2 >/tmp/13.2.prjconf
osc meta prjconf -m 'Original version from openSUSE' SUSE:13.2 -F /tmp/13.2.prjconf

```

Now you need to create the directory *'full'* for the binary sources under each architecture, this should be owned by **obsrun** too.

```

testobs:/srv/www/obs/api # mkdir /srv/obs/build/SUSE\13.2/standard/i586/:full
testobs:/srv/www/obs/api # mkdir /srv/obs/build/SUSE\13.2/standard/x86_64/:full
testobs:/srv/www/obs/api # chown obsrun:obsrun \
                          /srv/obs/build/SUSE\13.2/standard/i586/:full
testobs:/srv/www/obs/api # chown obsrun:obsrun \
                          /srv/obs/build/SUSE\13.2/standard/x86_64/:full

```

Now you can copy (or link) all binary packages for the architecture in the `:full` directory. You need the architecture specific package and the `noarch` packages as well.

Important

If you import packages for enterprise distributions like SLES12 you also need the packages from the SDK. Maybe you need packages from add-on products as well, depending what software you want build.

Finally you should trigger a rescan for the project on the back-end server using **obs_admin**:

```
testobs # obs_admin --rescan-repository SUSE:13.2 standard i586
testobs # obs_admin --rescan-repository SUSE:13.2 standard x86_64
```

This reads all packages and creates the dependency tree.

3.3 Source Services

Source Services are tools to validate, generate or modify sources in a trustable way. They are designed as smallest possible tools and can be combined following the powerful idea of the classic UNIX design.

Design goals of source services were:

- server side generated files must be easy to identify and must not be modifiable by the user. This way other users can trust them to be generated in the documented way without modifications.
- generated files must never create merge conflicts
- generated files must be a separate commit to the user change
- services must be runnable at any time without user commit
- services must be runnable on server and client side in the same way
- services must be designed in a safe way. A source checkout and service run must never harm the system of a user.
- services shall be designed in a way to avoid unnecessary commits. This means there shall be no time-dependent changes. In case the package already contains the same file, the newly generated file must be dropped.

- local services can be added and used by everybody.
- server side services must be installed by the admin of the OBS server.
- services can be defined per package or project wide.

3.3.1 Using Services for Validation

Source Services may be used to validate sources. This can happen per package, which is useful when the packager wants to validate that downloaded sources are really from the original maintainer. Or validation can happen for an entire project to apply general policies. These services cannot get skipped in any package

Validation can happen by validating files (for example using the verify_file or source_validator service. These services just fail in the error case which leads to the build state "broken". Or validation can happen by redoing a certain action and store the result as new file as download_files is doing. In this case the newly generated file will be used instead of the committed one during build.

3.3.2 Different Modes When Using Services

Each service can be used in a special mode defining when it should run and how to use the result. This can be done per package or globally for an entire project.

3.3.2.1 Default Mode

The default mode of a service is to always run after each commit on the server side and locally before every local build.

3.3.2.2 trylocal Mode

The trylocal mode is running the service locally when using current osc versions. The result gets committed as standard files and not named with `_service:` prefix. Additionally the service runs on the server by default, but usually the service should detect that the result is the same and skip the generated files. In case they differ for any reason (because the webui or API was used for example) they get generated and added on the server.

3.3.2.3 `localonly` Mode

The `localonly` mode is running the service locally when using current `osc` versions. The result gets committed as standard files and not named with `_service:` prefix. The service is never running on the server side. It is also not possible to trigger it manually.

3.3.2.4 `serveronly` Mode

The `serveronly` mode is running the service on the server only. This can be useful, when the service is not available or can not work on developer workstations.

3.3.2.5 `buildtime` Mode

The service is running inside of the build job, for local and server side builds. A side effect is that the service package is becoming a build dependency and must be available. Every user can provide and use a service this way in their projects. The generated sources are not part of the source repository, but part of the generated source packages. Network access is not available when the workers are running in a secure mode.

3.3.2.6 `disabled` Mode

The `disabled` mode is neither running the service locally or on the server side. It can be used to temporarily disable the service but keeping the definition as part of the service definition. Or it can be used to define the way how to generate the sources and doing so by manually calling `osc service disabledrun`. The result will get committed as standard files again.

3.3.3 Storage of Source Service Definitions

The called services are always defined in a `_service` file. It is either part of the package sources or used project-wide when stored inside the `_project` package.

The `_service` file contains a list of services which get called in this order. Each service may define a list of parameters and a mode. The project wide services get called after the per package defined services. The `_service` file is an xml file like this example:

```
<services>
```

```
<service name="download_files" mode="trylocal" />
<service name="verify_file">
  <param name="file">krabber-1.0.tar.gz</param>
  <param name="verifier">sha256</param>
  <param
name="checksum">7f535a96a834b31ba2201a90c4d365990785dead92be02d4cf846713be938b78</param>
</service>
<service name="update_source" mode="disabled" />
</services>
```

This example downloads the files via `download_files` service via the given URLs from the spec file. When using `osc` this file gets committed as part of the commit. Afterwards the `krabber-1.0.tar.gz` file will always be compared with the sha256 checksum. And last but not least there is the **`update_source`** service mentioned, which is usually not executed. Except when **`osc service disabledrun`** is called, which will try to upgrade the package to a newer source version available online.

3.3.4 Dropping a Source Service Again

Sometimes it is useful to continue work on generated files manually. In this situation the `_service` file needs to be dropped, but all generated files need to be committed as standard files. The OBS provides the "mergeservice" command for this. It can also be used via `osc` by calling **`osc service merge`**.

3.4 Dispatch Priorities

The dispatcher takes a job from the scheduler and assign it to a free worker. It tries to share the available build time fair between all the project repositories with pending jobs. To achieve this the dispatcher calculates a ***load*** per project repository of the used build time (similar to the system load in Unix operating systems). The dispatcher assigned jobs to build clients from the repository with the lowest load (thereby increasing the its load). It is possible to tweak this mechanism via dispatching priorities assigned to the repositories via the `/build/_dispatchprior-` API call or via the **`dispatch_adjust`** array in the *BSConfig.pm* [Section 2.1.2.2, "BSConfig.pm"](#) configuration file.

3.4.1 The /build/_dispatchprios API Call

The `/build/_dispatchprios` API call allows an Admin to set a priority for defined projects and repositories using the HTML put method. With the HTML get method the current XML priority file can be read.

```
<dispatchprios>
  <prio project="ProjectName" repository="RepoName" arch="Architecture" adjust="Number" />
</dispatchprios>
```

The attributes *project*, *repository* and *arch* are all optional, if for example *arch* and *repository* are missing the entry is used for all repositories and architectures for the given project. It is not supported to use regular expressions for the names. The adjust value is taken as logarithmic scale factor to the current load of the repositories during the compare. Projects without any entry get a default priority of 0, higher values cause the matching projects to get more build time.

Example dispatchprios XML file

```
<dispatchprios>
  <prio project="DemoProject1" repository="openSUSE_Leap_42.1" adjust="10" />
  <prio project="Test1" adjust="5" />
  <prio project="Test11" repository="openSUSE_13.2" arch="i586" adjust="-10"/>
</dispatchprios>
```

TABLE 3.1: **ROUNDED SCALE FACTORS RESULTING FROM A PRIORITY**

priority	scale factor	priority	scale factor
-50	100000	3	0.5
-30	1000	5	0.3
-20	100	7	0.2
-15	30	10	0.1
-10	10	15	0.03
-7	5	20	0.01
-5	3	30	0.001
-3	2	40	0.0001

priority	scale factor	priority	scale factor
0	1	50	0.00001

3.4.2 `dispatch_adjust` Array

With the *`dispatch_adjust`* array in the *`BSConfig.pm`* file the dispatch priorities of project repositories based on regular expressions for the project, repository name and maybe architecture. Each match will add or subtract a value to the priority of the repository. The default priority is 0, higher values cause the matching projects to get more build time.

Each entry in the `dispatch_adjust` array has the format

```
'regex string' => priority adjustment
```

The full name of a build repository looks like

```
Project:Subproject/Repository/Architecture
```

Examples:

```
Devel:Science/SLES-11/i586
home:king:test/Leap42/x86_64
```

If a repository matches a string the adjustment is added to the current value. The final value is the sum of the adjustments of all matched entries. This sum is the same logarithmic scale factor as described in the previous section.

Example `dispatch_adjust` definition in the *`BSConfig.pm`*

```
our $dispatch_adjust = [
  'Devel:' => 7,
  'HotFix:' => +20,
  '+:test.*' => -10,
  'home:' => -3,
  'home:king' => +30,
  '+/SLE12-SP2' => -40,
];
```

The above example could have the following background: All Devel projects should get some higher priority so the developer jobs getting more build time. The projects under HotFix are very important fixes for customers and so they should get a worker as soon as possible. All projects with test in the name get some penalty, also home projects are getting only about half

of the build time as a normal project, with the exception of the home project from king, the user account of the boss. The SLES12-SP2 repository is not in real use yet, but if here is nothing else to do build for it as well.

Important

The dispatcher calculates the values from the '*dispatch_adjust*' array first, if the same project and repository also has an entry in the *dispatchprios* XML file, the XML file entry will overwrite the calculated priority. The best practice is to only use one of the methods.

3.5 Publisher Hooks

The job of the publisher service is to publish the build packages and/or images by creating repositories that are made available through a web server.

It can be configured to use custom scripts to copy the build results to different servers or do anything with them that comes to mind. These scripts are called ***publisher hooks***.

3.5.1 Configuring Publisher Hooks

Hooks are configured via the configuration file */usr/lib/obs/server/BSConfig.pm*, where one script per project is linked to the repository that should be run if the project/repository combination is published. It is possible to use regular expressions here.

The script is called by the user `obsrun` with the following parameters:

1. information about the project and its repository (for example, `training/SLE11-SP1`)
2. path to published repository (for example, `/srv/obs/repos/training/SLE11-SP1`)
3. changed packages (for example, `x86_64/test.rpm x86_64/utils.rpm`)

The hooks are configured by adding a hash reference named `$publishedhook` to the *BSConfig.pm* configuration file. The key contains the project, and the value references the accompanying script. If the value is written as an array reference it is possible to call the hook with self-defined parameters.

The publisher will add the 3 listed parameters at the end, after the self-defined parameters (in /usr/lib/obs/server/BSConfig.pm):

```
our $publishedhook = {
  "Product/SLES12"    => "/usr/local/bin/script2run_sles12",
  "Product/SLES11-SP3" => "/usr/local/bin/script2run_sles11",
  "Product/SLES11-SP4" => "/usr/local/bin/script2run_sles11",
};
```

Regular expressions or substrings can be used to define a script for more than one repository in one project. The use of regular expressions has to be activated by defining \$publishedhook use regex = 1; as follows (in /usr/lib/obs/server/BSConfig.pm):

```
our $publishedhook_use_regex = 1;
our $publishedhook = {
  "Product\SLES12"    => "/usr/local/bin/script2run_sles12",
  "Product\SLES11.*" => "/usr/local/bin/script2run_sles11",
};
```

With self defined parameters:

```
our $publishedhook_use_regex = 1;
our $publishedhook = {
  "Product\SLES11.*" => ["/usr/local/bin/script2run", "sles11", "/srv/www/
public_mirror"],
};
```

The configuration is read by the publisher at startup only, so it has to be restarted after configuration changes have been made. The hook script's output is not logged by the publisher and should be written to a log file by the script itself. In case of a broken script, this is logged in the publisher's log file (/srv/obs/log/publisher.log by default):

```
Mon Mar 7 14:34:17 2016 publishing Product/SLES12
  fetched 0 patterns
  running createrepo
  calling published hook /usr/local/bin/script2run_sles12
  /usr/local/bin/script2run_sles12 failed: 65280
  syncing database (6 ops)
```

Interactive scripts are not working and will fail immediately.

If you need to do a lot of work in the hook script and do not want to block the publisher all the time, you should consider using a separate daemon that does all the work and just gets triggered by the configured hook script.

The scripts are called without a timeout.

3.5.2 Example Publisher Scripts

3.5.2.1 Simple Publisher Hook

The following example script ignores the packages that have changed and copies all RPMs from the repository directory to a target directory:

```
#!/bin/bash
OBSHOME="/srv/obs"
SRC_REPO_DIR="$OBSHOME/repos"
LOGFILE="$OBSHOME/log/reposync.log"
DST_REPO_DIR="/srv/repo-mirror"
# Global substitution! To handle strings like Foo:Bar:testing - two
#+double-colons!
PRJ_PATH=${1//:/\}
PATH_TO_REPO=$2
rsync -a --log-file=$LOGFILE $PATH_TO_REPO/ $DST_REPO_DIR/$PRJ_PATH/
```

For testing purposes, it can be invoked as follows:

```
$ sudo -u obsrun /usr/local/bin/publish-hook.sh Product/SLES11-SP1 \
/srv/obs/repos/Product/SLE11-SP1
```

3.5.2.2 Advanced Publisher Hook

The following example script reads the destination path from a parameter that is configured with the hook script:

```
#!/bin/bash
LOGFILE="/srv/obs/log/reposync.log"
DST_REPO_DIR=$1
# Global substion! To handle strings like Foo:Bar:testing - two
#+double-colons!
PRJ_PATH=${2//:/\}
PATH_TO_REPO=$3
mkdir -p $DST_REPO_DIR/$PRJ_PATH
rsync -a --log-file=$LOGFILE $PATH_TO_REPO/ $DST_REPO_DIR/$PRJ_PATH/
```

For testing purposes, it can be invoked as follows:

```
$ sudo -u obsrun /usr/local/bin/publish-hook.sh \  
  /srv/www/public_mirror/Product/SLES11-SP1 \  
  /srv/obs/repos/Product/SLE11SP1
```

The following example script only copies packages that have changed, but does not delete packages that have been removed:

```
#!/bin/bash  
  
DST_REPO_DIR=$1  
PRJ_PATH=${2//:/\}/  
PATH_TO_REPO=$3  
shift 3  
  
mkdir -p $DST_REPO_DIR/$PRJ_PATH  
  
while [ $# -gt 0 ]  
do  
  dir=${1//\// }  
  if [ ! -d "$DST_REPO_DIR/$PRJ_PATH/$dir" ]; then  
    mkdir -p $DST_REPO_DIR/$PRJ_PATH/$dir  
  fi  
  cp $PATH_TO_REPO/$1 $DST_REPO_DIR/$PRJ_PATH/$1  
  shift  
done  
  
createrepo $DST_REPO_DIR/$PRJ_PATH/.
```

For testing purposes, it can be invoked as follows:

```
$ sudo -o obsrun /usr/local/bin/publish-hook.sh /srv/www/public_mirror \  
  Product/SLES11-SP1 /srv/obs/repos/Product/SLE11-SP1 \  
  src/icinga-1.13.3-1.3.src.rpm x86_64/icinga-1.13.3-1.3.x86_64.rpm \  
  x86_64/icinga-devel-1.13.3-1.3.x86_64.rpm
```

3.6 Unpublisher Hooks

The job of the publisher service is to publish the build packages and/or images by creating repositories that are made available through a web server.

The OBS Publisher can be configured to use custom scripts to be called whenever already published packages get removed. These scripts are called **unpublisher hooks**. **Unpublisher hooks** are run before the **publisher hooks**.

3.6.1 Configuring Unpublisher Hooks

Hooks are configured via the configuration file `/usr/lib/obs/server/BSConfig.pm`, where one script per project is linked to the repository that should be run if the project/repository combination is removed. It is possible to use regular expressions here.

The script is called by the user `obsrun` with the following parameters:

1. information about the project and its repository (for example, `training/SLE11-SP1`)
2. repository path (for example, `/srv/obs/repos/training/SLE11-SP1`)
3. removed packages (for example, `x86_64/test.rpm x86_64/utils.rpm`)

The hooks are configured by adding a hash reference named `$unpublishedhook` to the `BSConfig.pm` configuration file. The key contains the project and the value references the accompanying script. If the value is written as an array reference, it is possible to call the hook with custom parameters.

The publisher adds the three listed parameters at the end, directly after the custom parameters (in `/usr/lib/obs/server/BSConfig.pm`):

```
our $unpublishedhook = {
    "Product/SLES12"      => "/usr/local/bin/script2run_sles12",
    "Product/SLES11-SP3" => "/usr/local/bin/script2run_sles11",
    "Product/SLES11-SP4" => "/usr/local/bin/script2run_sles11",
};
```

Regular expressions or substrings can be used to define a script for more than one repository in one project. The use of regular expressions needs to be activated by defining `$unpublishedhook` use `regex = 1`; (in `/usr/lib/obs/server/BSConfig.pm`):

```
our $unpublishedhook_use_regex = 1;
our $unpublishedhook = {
    "Product\SLES12"      => "/usr/local/bin/script2run_sles12",
    "Product\SLES11.*"   => "/usr/local/bin/script2run_sles11",
};
```

With custom parameters:

```
our $unpublishedhook_use_regex = 1;
our $unpublishedhook = {
  "Product/SLES11.*" => [
    "/usr/local/bin/script2run", "sles11", "/srv/www/public_mirror"
  ],
};
```

The configuration is read by the publisher at startup only, so it has to be restarted after configuration changes have been made. The hook script's output is not logged by the publisher and should be written to a log file by the script itself. In case of a broken script, this is logged in the publisher's log file (`/srv/obs/log/publisher.log` by default):

```
Mon Mar 7 14:34:17 2016 publishing Product/SLES12
  fetched 0 patterns
  running createrepo
  calling unpublished hook /usr/local/bin/script2run_sles12
  /usr/local/bin/script2run_sles12 failed: 65280
  syncing database (6 ops)
```

Interactive scripts are not working and will fail immediately.

If you need to do a lot of work in the hook script and do not want to block the publisher all the time, consider using a separate daemon that does all the work and just gets triggered by the configured hook script.

The scripts are called without a timeout.



Note

Reminder: If *unpublish hooks* and *publish hooks* are defined, the *unpublish hook* runs before the *publish hook*.

3.6.2 Example Unpublisher Scripts

3.6.2.1 Simple Unpublisher Hook

The following example script deletes all packages from the target directory that have been removed from the repository.

```
#!/bin/bash
OBSHOME="/srv/obs"
LOGFILE="$OBSHOME/log/reposync.log"
DST_REPO_DIR="/srv/repo-mirror"
# Global substitution! To handle strings like Foo:Bar:testing - two
#+double-colons!
PRJ_PATH=${1//:/:\}
PATH_TO_REPO=$2

shift 2

while [ $# -gt 0 ]
do
    rm -v $DST_REPO_DIR/$PRJ_PATH/$1 >>$LOGFILE 2>&1
    shift
done
```

For testing purposes, it can be invoked as follows:

```
$ sudo -u obsrun /usr/local/bin/unpublish-hook.sh \
    Product/SLES11-SP1 \
    /srv/obs/repos/Product/SLE11-SP1 \
    src/icinga-1.13.3-1.3.src.rpm \
    x86_64/icinga-1.13.3-1.3.x86_64.rpm \
    x86_64/icinga-devel-1.13.3-1.3.x86_64.rpm
```

3.6.2.2 Advanced Unpublisher Hook

The following example script reads the destination path from a parameter that is configured via the hook script:

```
#!/bin/bash
OBSHOME="/srv/obs"
LOGFILE="$OBSHOME/log/reposync.log"
DST_REPO_DIR=$1
# Global substitution! To handle strings like Foo:Bar:testing - two
#+double-colons!
PRJ_PATH=${1//:/:\}
PATH_TO_REPO=$2

shift 3

while [ $# -gt 0 ]
do
    rm -v $DST_REPO_DIR/$PRJ_PATH/$1 >>$LOGFILE 2>&1
```

```
shift
done
```

For testing purposes, it can be invoked as follows:

```
$ sudo -u obsrun /usr/local/bin/unpublish-hook.sh \  
  /srv/www/public_mirror/Product/SLES11-SP1      \  
  /srv/obs/repos/Product/SLE11SP1                \  
  src/icinga-1.13.3-1.3.src.rpm                  \  
  x86_64/icinga-1.13.3-1.3.x86_64.rpm           \  
  x86_64/icinga-devel-1.13.3-1.3.x86_64.rpm
```

3.7 Managing Users and Groups

The OBS has an integrated user and group management with a role based access rights model. In every OBS instance, at least one user need to exist and have the global Admin role assigned. Groups can be defined by the Admin and instead of adding a list of users to a project/package role user can be added to a group and the group will be added to a project or package role.

3.7.1 User and Group Roles

The OBS role model has one global role: Admin, which can be granted to users. An OBS admin has access to all projects and packages via the API interface and the web user interface. Some menus in the Web UI do not allow changes by an Admin (for example, the Repository menu) as long the Admin is not a Maintainer for the project as well. But the same change can be done via editing the meta data directly. The other roles are specific to projects and packages and can be assigned to a user or a group.

TABLE 3.2: ROLES IN OBS

Role	Description	Remarks
Maintainer	Read and write access to projects or packages	
Bugowner	Read access to projects or packages	should be unique per package
Reader	Read access to sources	

Role	Description	Remarks
Down-loader	Read access to the binaries	
Reviewer	Default reviewer for a package or project	

3.7.2 Standalone User and Group Database

OBS provides its own user database which can also store a password. The authentication to the API happens via HTTP BASIC AUTH. See the API documentation to find out how to create, modify or delete user data. Also a call for changing the password exists.

Users can be added by the maintainer or if registration is allowed via the registration menu on the Web UI. It can be configured that a confirmation is needed after registration before the user may login.

3.7.3 Proxy Mode

The proxy mode can be used for specially secured instances, where the OBS web server shall not get connected to the network directly. There are authentication proxy products out there which do the authentication and send the user name via an HTTP header to OBS. Originally, this was developed for IChain - a legacy single login authentication method from Novell. This also has the advantage that the user password never reaches OBS.

The proxy mode can also be used for LDAP or Active Directory, but only for authentication.



Important

With enabled proxy mode the OBS trust the username in the http header. Since this was verified by the Web server and the Web server only forward requests for a verified and authenticated session, this is safe, as long you make sure that the direct web/API interface of the OBS is not reachable from the outside.

With the proxy mode the user still need to be registered in the OBS and all OBS roles and user properties are managed inside the OBS.

3.7.3.1 OBS Proxy Mode Configuration

Currently the LDAP configuration is in the *options.yml* file.

TABLE 3.3: OPTIONS FOR PROXY MODE CONFIGURATION

Config item	Description	Values <u>de-</u> <u>fault</u>	Remarks
proxy_auth_mode	turn proxy mode on/ off	<u>:off</u> :on	need to be :off if ldap_mode: is :on

3.7.4 LDAP/Active Directory



Note

The LDAP support is considered experimental and is not officially supported.

Using LDAP or Active Directory as source for user and optional group information in environments which already have such a server has the advantage for the admin people that the user related information only need to be maintained in one place. In the following sections we are writing LDAP, but this includes Microsoft's Active Directory as well. Only in parts where differences exists Active Directory (AD) will be explicit mentioned.

In this mode the OBS contact the LDAP server directly from the OBS API, if the user was found and provides the correct password the user is added transparently to the OBS user database. The password or password hash is not stored in the OBS database. Because the user database password field is mandatory, a random hash is stored instead. The LDAP interface allows to restrict the access to users which are in a special LDAP group. Optional also groups can be discovered from the LDAP server. This can be also filtered.

Before anybody can add a user to a package or project with a role, the user need to had logged in at least one time, since the check for available users is local only. If the LDAP group mode is enabled, LDAP groups are also added transparently, if an existing group on the LDAP server is added to a project or package.

On bigger installations this mode can result in many search requests to the LDAP server and slow down access to projects and packages, because on every role check an LDAP search operation will contact the LDAP server. As alternative method group mirroring was implemented. This

allows that the internal OBS group database is updated with the group membership information during the user authentication. All role test are made local against the OBS database and do not need additional LDAP operations.



Note

The local user group membership in `:mirror` mode is updated as follows: When the user logs in, the user *memberOf* attributes are parsed and compared with the global OBS group list, if a group matches, the user is added, if they are no longer a group member, they are removed. since this maybe a costly operation, depending on the group counts, this is only done on a full login. After a full login the user status is cached for 2 minutes, if the user do a login during this time, nothing will be checked or updated. Here is a second mechanism to update user membership: If somebody adds a new Group in the OBS, the *member* attributes of the group are parsed and all current users which are in the local database become members.

3.7.4.1 OBS LDAP Configuration

Currently the main OBS LDAP configuration is in the *options.yml* file. Beside the settings here also the *openldap* config file is evaluated by the Ruby LDAP implementation. This configfile is usually located at */etc/openldap/ldap.conf*. You can set here additional TLS/SSL directives like **TLS_CACERT**, **TLS_CACERTDIR** and **TLS_REQCERT**. For more information refer to the *openldap ldap.conf* man page.



Note

Once LDAP mode is activated users can only log in via LDAP. This also includes existing admin accounts. To make a LDAP user, for example, user tux, an admin we provided a rake task which can be run on the OBS instance:

```
cd /srv/www/obs/api
bundle exec rake user:give_admin_rights tux RAILS_ENV=production
```

TABLE 3.4: LDAP CONFIGURATION OPTIONS

Config item	Description	Values <u>de-</u> <u>fault</u>	Remarks
ldap_mode	OBS LDAP mode on/ off	<u>:off</u> :on	
ldap_servers	List of LDAP servers		colon-separated list
ldap_max_attempts	tries to ping LDAP server	int <u>15</u>	
ldap_search_timeout	timeout of an LDAP search	int 0...N <u>5</u>	0 wait for ever
ldap_user_memberof_attr	User attribute for Group membership	<u>memberOf</u>	case sensitive
ldap_group_member_attr	Group attribute for members	<u>member</u>	
ldap_ssl	use ldaps port and pro- tocol	<u>:off</u> :on	
ldap_start_tls	usr Start TLS on LDAP protocol	:off <u>:on</u>	
ldap_port	LDAP portnumbers		if not set 389 for LDAP, 636 for LDAPS
ldap_referrals	Windows 2003 AD re- quires	<u>:off</u> :on	
ldap_search_base	company's LDAP search base for the users who will use OBS	<u>none</u>	
ldap_search_attr	user ID attribute	<u>sAMAccount -</u> <u>Name uid</u>	sAMAccountName for AD, uid for openldap

Config item	Description	Values <u>de-</u> <u>fault</u>	Remarks
ldap_name_attr	Full user name	<u>cn</u>	
ldap_mail_attr	Attribute for users email	<u>mail</u>	
ldap_search_user	Bind user for LDAP search		for example, cn = ldapbind, ou = system, dc = mycompany, dc = com
ldap_search_auth	Password for the ldap_search_user		
ldap_user_filter	Search filter for OBS users		for example, a group membership, empty all users allowed
ldap_authenticate	How user how the credentials are verified	<u>:ldap</u> :local	only use :ldap
ldap_auth_mech	Used auth mech	<u>:md5</u> :cleartext	only if local
ldap_auth_attr	Used auth attribute for :local	<u>userPassword</u>	do not use
ldap_group_support	Import OBS groups from LDAP	<u>:off</u> :on :mirror	see text
ldap_group_search_base	company's LDAP search base for groups		
ldap_group_title_attr	Attribute of the group name	<u>cn</u>	

Config item	Description	Values <u>de-</u> <u>fault</u>	Remarks
ldap_group_objectclass_attr	Object class for group	<u>Group</u>	
ldap_obs_admin_group	Group name for OBS Admins		if set, members of that group become OBS admin role

Example LDAP section of the *options.yml* file:

```
[...]
#####
# LDAP options
#####

ldap_mode: :on
# LDAP Servers separated by ':'.
# OVERRIDE with your company's ldap servers. Servers are picked randomly for
# each connection to distribute load.
ldap_servers: ldap1.mycompany.com:ldap2.mycompany.com

# Max number of times to attempt to contact the LDAP servers
ldap_max_attempts: 15

# timeout of an ldap search requests to avoid infinitely lookups (in seconds, 0 no
# timeout)
ldap_search_timeout: 5

# The attribute the user member of is stored in (case sensitive !)
ldap_user_memberof_attr: memberOf

# Perform the group_user search with the member attribute of group entry or memberof
# attribute of user entry
# It depends on your ldap define
# The attribute the group member is stored in
ldap_group_member_attr: member

# If you're using ldap_authenticate=:ldap then you should ensure that
# ldaps is used to transfer the credentials over SSL or use the StartTLS extension
ldap_ssl: :on

# Use StartTLS extension of LDAP
ldap_start_tls: :off
```

```

# LDAP port defaults to 636 for ldaps and 389 for ldap and ldap with StartTLS
#ldap_port:
# Authentication with Windows 2003 AD requires
ldap_referrals: :off

# OVERRIDE with your company's ldap search base for the users who will use OBS
ldap_search_base: ou=developmentt,dc=mycompany,dc=com
# Account name attribute (sAMAccountName for Active Directory, uid for openLDAP)
ldap_search_attr: sAMAccountName
# The attribute the users name is stored in
ldap_name_attr: cn
# The attribute the users email is stored in
ldap_mail_attr: mail
# Credentials to use to search ldap for the username
ldap_search_user: "cn=ldapbind,ou=system,dc=mycompany,dc=com"
ldap_search_auth: "top secret"

# By default any LDAP user can be used to authenticate to the OBS
# In some deployments this may be too broad and certain criteria should
# be met; eg group membership
#
# To allow only users in a specific group uncomment this line:
ldap_user_filter: (memberof=cn=obsusers,ou=groups,dc=mycompany,dc=com)
#
# Note this is joined to the normal selection like so:
# (&#{ldap_search_attr}=#login)#{ldap_user_filter}
# giving an ldap search of:
# (&(sAMAccountName=#login)(memberof=CN=group,OU=Groups,DC=Domain Component))
#
# Also note that openLDAP must be configured to use the memberOf overlay

# ldap_authenticate says how the credentials are verified:
# :ldap = attempt to bind to ldap as user using supplied credentials
# :local = compare the credentials supplied with those in
#         LDAP using #{ldap_auth_attr} & #{ldap_auth_mech}
#         if :local is used then ldap_auth_mech can be
#         :md5
#         :cleartext
ldap_authenticate: :ldap
ldap_auth_mech: :md5
# This is a string
ldap_auth_attr: userPassword

# Whether to search group info from ldap, it does not take effect it is not set
# Please also set below ldap_group_* configs correctly to ensure the operation works
properly

```

```
# Possible values:
#      :off      disabled
#      :on       enabled; every group member operation ask the LDAP server
#      :mirror   enabled; group membership is mirrored and updated on user login
#
ldap_group_support: :mirror

# OVERRIDE with your company's ldap search base for groups
ldap_group_search_base: ou=obsgroups,dc=mycompany,dc=com

# The attribute the group name is stored in
ldap_group_title_attr: cn

# The value of the group objectclass attribute
# group for Active Directory, groupOfNames in openLDAP
ldap_group_objectclass_attr: group

# The LDAP group for obs admins
# if this group is set and a user belongs to this group they get the global admin role
#
ldap_obs_admin_group: obsadmins
```

3.7.5 Authentication Methods

3.7.5.1 LDAP Methods

The LDAP mode has 2 methods to check authorization:

1. LDAP bind method. With the provided credentials, an LDAP bind request is tried.
2. Local method. The provided credentials checked locally against the content of the *userPassword* attribute.

Important

The local method should be not used, since the *userPassword* attribute in most LDAP installations will not be available until you are bind with a privilege user.

3.7.5.2 Kerberos

In OBS you can use single sign on via Kerberos tickets.

OBS Kerberos configuration resides in the *options.yml* file.

TABLE 3.5: KERBEROS CONFIGURATION OPTIONS

Config item	Description	Example
kerberos_keytab	Kerberos key table: file where long-term keys for one or more principals are stored	"/etc/krb5.keytab"
kerberos_service_principal	Kerberos OBS principal: OBS unique identity to which Kerberos can assign tickets	"HTTP/hostname.example.com@EXAMPLE.COM"
kerberos_realm	Kerberos realm: authentication administrative domain	"EXAMPLE.COM"

Example Kerberos section of the options.yml file:

```
[...]  
  
#####  
# Kerberos options  
#####  
  
kerberos_mode: true  
kerberos_keytab: "/etc/krb5.keytab"  
kerberos_service_principal: "HTTP/hostname.example.com@EXAMPLE.COM"  
kerberos_realm: "EXAMPLE.COM"  
  
[...]
```



Note

Once Kerberos is enabled, only users with logins that match users known to Kerberos will be able to authenticate to OBS. It is recommended to give admin rights to a matching user before enabling Kerberos mode.

3.7.5.3 OBS Token Authorization

OBS 2.5 provides a mechanism to create tokens for specific operations. This can be used to allow certain operations in the name of a user to others. This is esp. useful when integrating external infrastructure. The create token should be kept secret by default, but it can also be revoked at any time if it became obsolete or leaked.

3.7.5.3.1 Managing Tokens of a User

Tokens belong always to a user. A list of active tokens can be received via

```
osc token
```

```
osc token --delete <TOKEN>
```

3.7.5.3.2 Executing a Source Service

A token can be used to execute a source service. The source service has to be setup for the package first, check the source service chapter for this. A typical example is to update sources of a package from git. A source service for that can be setup with

```
osc add git://....
```

A token can be registered as generic token, means allowing to execute all source services in OBS if the user has permissions. You can create such a token and execute the operation with

```
osc token --create
```

```
osc token --trigger <TOKEN> <PROJECT> <PACKAGE>
```

```
osc api -X POST /trigger/runservice?token=<TOKEN>&project=<PROJECT>&package=<PACKAGE>
```

You can also limit the token to a specific package. The advantage is that the operation is limited to that package, so less bad things can happen when the token leaks. Also you do not need to specify the package on execution time. Create and execute it with

```
osc token --create <PROJECT> <PACKAGE>
```

```
osc token --trigger <TOKEN>
```

```
osc api -X POST /trigger/runservice?token=<TOKEN>
```

3.8 Backup

3.9 Spider Identification

OBS is hiding specific parts/pages of the application from search crawlers (duckduckgo, google etc.), mostly for performance reasons. Which user-agent strings are identified as crawlers configured in the file `/srv/www/obs/api/config/crawler-user-agents.json`.

To update that list, you must run the command `bundle exec rake voight_kampf:import_user_agents` in the root directory of your OBS instance. This downloads the current crawler list of user agents as a JSON file into the `config/` directory of the Rails application.

If you want to extend or edit this list, switch to the `config/` directory and open the `crawler-user-agents.json` file with the editor of your choice. The content can look like this:

```
[
  {
    "pattern": "Googlebot\\/",
    "url": "http://www.google.com/bot.html"
  },
  {
    "pattern": "Googlebot-Mobile"
  },
  {
    "pattern": "Googlebot-Image"
  },
  [...]
]
```

To add a new bot to this list, a pattern must be defined. This is required to identify a bot. Almost all bots have their own user agent that they are sending to a Web server to identify them. For example, the user agent of the Googlebot looks like this:

```
Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)
```

To choose the pattern for the new bot, compare the user agent of the bot you want to identify with others and look for a part that is unique (like in the Googlebot example, the part: Googlebot).

Let's assume we want to add the bot Geekobot to the list of bots and the user agent looks like this:

```
Mozilla/5.0 (compatible; Geekobot/2.1; +https://www.opensuse.org)
```

Our unique part would be Geekobot. So we add a new entry to the list of bots:

```
[
  {
    "pattern": "Googlebot\\/",
    "url": "http://www.google.com/bot.html"
  },
  {
    "pattern": "Googlebot-Mobile"
  },
  {
    "pattern": "Googlebot-Image"
  },
  [...]
  {
    "pattern": "Geekobot"
  }
]
```



Note

You can also use regular expressions in the pattern element.

Save the file and restart the Rails application and the bot Geekobot should be identified properly.

4 Troubleshooting

Here are two major classes of problems regarding the Open Build Service:

1. Normal package build errors
2. Bugs, resource shortage or config issues caused issues

The first category are errors like missing dependent packages in the build environment, errors during compiling or linking, errors in the build description and so on. Most of them should not happen if the packager does test the build locally before committing it to the OBS. This type of problems is not covered by this chapter.

4.1 General Hints

If you detect unexpected behavior of the open build service, you should follow some rules to locate the problem:

1. Consult the log files, for the back-end look at `/srv/obs/log` for the back-end log files and `/srv/www/obs/api/log` for the front-end log files. See the Log files [Section 2.2, "Log Files"](#) for more details.
2. Consult the normal OS system logs and the kernel log (`dmesg`) if here are reported system or HW problems.
3. Check if all services are running on the back-end and front-end. See the OBS Architecture in reference book for details.
4. Try to find an easy way to reproduce the problem.
5. To check whether this issue was already reported, see <https://github.com/openSUSE/open-build-service>.
6. Use search machines (Google) to find out if others did also run into this problem. If you are lucky, you will find a fix or workaround as well.
7. If you create a new bug report, include all information to reproduce the problem and the complete error message/error log if here are any.

4.2 Debugging Front-end Problems

If you get unexpected results from submitting commands with the **osc** tool, you can use the debug feature of the tools to find more information about what happened.

osc debug options

```
--debugger      jump into the debugger before executing anything
--post-mortem   jump into the debugger in case of errors
-t, --traceback print call trace in case of errors
-H, --http-debug debug HTTP traffic (filters some headers)
--http-full-debug debug HTTP traffic (filters no headers)
-d, --debug     print info useful for debugging
```

The **--debugger** and **--post-mortem** are only suitable for *osc* developers. If you get an error message from *osc*, the **-t**, **--traceback** can give the developer some more information about the problem. The **-H**, **--http-debug** and **--http-full-debug** options are useful to see the raw answers of OBS API, often this gives a hint what may be wrong. If you report a problem regarding the *osc* tool, it may help to include the *osc* output with **additional** ***--http-debug --traceback** options.



Warning

With **--http-full-debug** all http headers are included, this may include user data and authentication stuff so review and replace such data with XXXXXXXXX or so before you post it on the internet.

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