

How to build zlm-cython module from the sources

Practical approach to extending Zabbix Server and an Agent

- ◆ Build preparation and dependencies
- ◆ Building the extension
- ◆ Installation
- ◆ Verification

```
[root@zabbix-251-2 ~]# pip install --upgrade cython
Requirement already up-to-date: cython in /usr/lib64/python2.7/site-packages
[root@zabbix-251-2 ~]# cython --version
Cython version 0.23.3
[root@zabbix-251-2 ~]#
```

- ◆ Install or upgrade Cython using python-pip
- ◆ Verify, that your installed Cython is fairly recent

```
[root@zabbix-251-2 ~]# yum install python-devel
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
* base: centos.mirrors.tds.net
* extras: mirrors.seas.harvard.edu
* updates: mirror.team-cymru.org
Package python-devel-2.7.5-18.el7_1.1.x86_64 already installed and latest version
Nothing to do
[root@zabbix-251-2 ~]#
```

- ◆ Install or upgrade python-devel package or install python interpreter from the scratch⁽¹⁾.

⁽¹⁾ <http://www.python.org>

```
[root@zabbix-251-2 ~]# python-config --includes  
-I/usr/include/python2.7 -I/usr/include/python2.7  
[root@zabbix-251-2 ~]# python-config --ldflags  
-lpthread -ldl -lutil -lm -lpython2.7 -Xlinker -export-dynamic  
[root@zabbix-251-2 ~]#
```

- ◆ Verify, that the *python-config* provides you correct parameters, for building Python extensions

```
[root@zabbix-251-2 ~]# tar xzf ~/Src/zabbix-2.5.0.tar.gz
[root@zabbix-251-2 ~]# ls zabbix-2.5.0
aclocal.m4  build      conf       configure  database  include    m4         man        NEWS      upgrades
AUTHORS    ChangeLog  config.guess  configure.ac  depcomp   INSTALL    Makefile.am  misc       README
bin        compile   config.sub  COPYING      frontends  install-sh  Makefile.in  missing    src
```

- ◆ Install and configure your Zabbix source tree.

Even if you are installing Zabbix from the binary packages, you will need Zabbix source tree to compile Zabbix Loadable Module.

```
[root@zabbix-251-2 ~]# mkdir build
[root@zabbix-251-2 ~]# cd build/
[root@zabbix-251-2 build]# git clone https://github.com/vulogov/zlm-cython.git
Cloning into 'zlm-cython'...
remote: Counting objects: 121, done.
remote: Total 121 (delta 0), reused 0 (delta 0), pack-reused 121
Receiving objects: 100% (121/121), 28.24 KiB | 0 bytes/s, done.
Resolving deltas: 100% (64/64), done.
```

- ◆ Clone zlm-cython source repository from the github.com

```
[root@zabbix-251-2 src]# cd ../../zlm-cython/src/
[root@zabbix-251-2 src]# ./BUILD.sh
Building pyzabbix environment
Will compile against Zabbix from ../../zabbix-2.5.0
Checking if Sorce tree was configured
Zabbix source tree already configured
Building python.cfg ok
Building python.so
+ make -e all
cython -o zlm_python_pyx.c zlm_python.pyx
gcc -g -fPIC -c -I../../zabbix-2.5.0/include -I/usr/include/libxml2 -I/usr/include/python2.7 -I/usr/include/python2.7
-o zlm_python_pyx.o zlm_python_pyx.c
gcc -g -fPIC -c -I../../zabbix-2.5.0/include -I/usr/include/libxml2 -I/usr/include/python2.7 -I/usr/include/python2.7
-o zlm_python.o zlm_python.c
In file included from /usr/include/python2.7/pyconfig.h:6:0,
                 from /usr/include/python2.7/Python.h:8,
                 from zlm_python.c:13:
/usr/include/python2.7/pyconfig-64.h:1182:0: warning: "_POSIX_C_SOURCE" redefined [enabled by default]
#define _POSIX_C_SOURCE 200112L
^
In file included from /usr/include/stdio.h:27:0,
                 from ../../zabbix-2.5.0/include/sysinc.h:26,
                 from zlm_python.c:6:
/usr/include/features.h:231:0: note: this is the location of the previous definition
# define _POSIX_C_SOURCE 200809L
^
gcc -shared -o zlm_python.so zlm_python_pyx.o zlm_python.o -lpthread -ldl -lutil -lm -lpython2.7
+ set +x
```



Change directory to *zlm-cython/src* and execute *./BUILD.sh*

```
[root@zabbix-251-2 src]# cp python.cfg zlm_python.so /usr/local/etc/  
cp: overwrite '/usr/local/etc/python.cfg'? y  
cp: overwrite '/usr/local/etc/zlm_python.so'? y  
[root@zabbix-251-2 src]# mkdir -p /usr/local/etc/pymodules /usr/local/etc/pydaemons/  
[root@zabbix-251-2 src]# mkdir -p /usr/local/etc/pymodules/lib
```

- ◆ Pick the directory, which you will use as the “root” for your loadable modules
- ◆ Create subdirectories:
 - pymodules;
 - pymodules/lib;
 - pydaemons
- ◆ Copy *zlm_python.so*, *zlm_python.ini* and *python.cfg* to your modules “root”

```
[root@zabbix-251-2 src]# cp pymodules/lib/*.py /usr/local/etc/pymodules/lib/  
[root@zabbix-251-2 src]# cp pymodules/*.py /usr/local/etc/pymodules/
```

- ◆ Copy modules located in pymodules/lib of your source directory to your destination pymodules/lib
- ◆ Copy modules located in pymodules of your source directory to your destination pymodules
- ◆ Copy modules located in pydaemons of your source directory to your destination pydaemons only if you want to install sample daemons
- ◆ Make sure, that user zabbix do have an access to this files and directories.

Filename or Directory name	Description
<code>zlm_python.so</code>	Python Zabbix Loadable Module.
<code>pymodules</code>	Directory for Python modules available to Python ZLM. Only modules in that directory will be available for the calls <code>py[<modulename>, {parameters}]</code>
<code>pymodules/lib</code>	Python ZLM-specific Python modules.
<code>pydaemons</code>	If the module placed in this directory will export class <code>Daemon</code> , subclass of the <code>ZLM_Metric_Collector</code> , Python ZLM will spawn an instance of this class as separate thread.
<code>python.cfg</code>	Configuration file for Python interpreter
<code>zlm_python.ini</code>	Configuration file for Python ZLM

Adjust Server or Agent configuration files

- ♦ *zabbix_server.conf*
- ♦ *zabbix_agentd.conf* ***

Parameter in Config File	Description
<code>LoadModulePath</code>	Full path to location of agent modules. The value for this variable shall be path name where you loadable modules are installed.
<code>LoadModule</code>	Module to load at agent startup. The value of this variable will be <code>zlm_python.so</code>

*** If you are enabling Python ZLM on the Zabbix Agent, please be sure that you are updating proper configuration file, which is `zabbix_agentd.conf`, not `zabbix_agent.conf`

```
[root@zabbix-251 etc]# service zabbix_server restart
Restarting zabbix_server (via systemctl): [ OK ]
[root@zabbix-251 etc]# service zabbix_agentd restart
Restarting zabbix_agentd (via systemctl): [ OK ]
[root@zabbix-251 etc]# ps ax|grep zabbix_server|wc -l
29
[root@zabbix-251 etc]# ps ax|grep zabbix_agentd|wc -l
8
```

- ◆ Restart your Zabbix Server or an Agent. Check if Restart was successful
- ◆ Check the Server or Agent log files for any errors

◆ Call python.ping item

```
[root@zabbix-251 etc]# zabbix_get -s 127.0.0.1 -k python.ping  
1
```

If this call return “1” you Python ZLM on agent loaded correctly.

◆ Try to call any py[] item

```
[root@zabbix-251 etc]# zabbix_get -s localhost -k py[ZBX_time]  
1443669801.445413
```

- ◆ Author: Vladimir Ulogov
- ◆ E-mail: vladimir.ulogov@zabbix.com
- ◆ GitHub.com: <https://github.com/vulogov/zlm-cython>