文档目录

mysqltools简介

- ## mysqltools要解决的问题

    - 1 自动化安装配置各类mysql相关环境

```
   之前有人对我说：“安装一个mysql这么容易的事还要写个工具？半个小时就能解决的事！” 你打算每次都手工做吗？  ...
   我想说“年轻人你的思想很危险啊！ ”
   1、  这样发展下去第2、第3 ... 第100 个的时候都还是要花你半小时、你的生产力没有提高呀!
   2、  你的输出只是一碗“蛋炒饭”、这碗”蛋炒饭"好不好吃、很大一部分取决你炒它时的心情；想想KFC的汉堡、它只要做出一个
         80分的汉堡，然而再把这个汉堡的制作流程记录下来、以后的每个汉堡都完全按这个程序走、每汉堡都是80分的；如果以后找到
         了流程中可以改进的地方、就可以把输出汉堡的质量再提高；  最大的好处在于这个上过程中没有减法、只有加法。
```

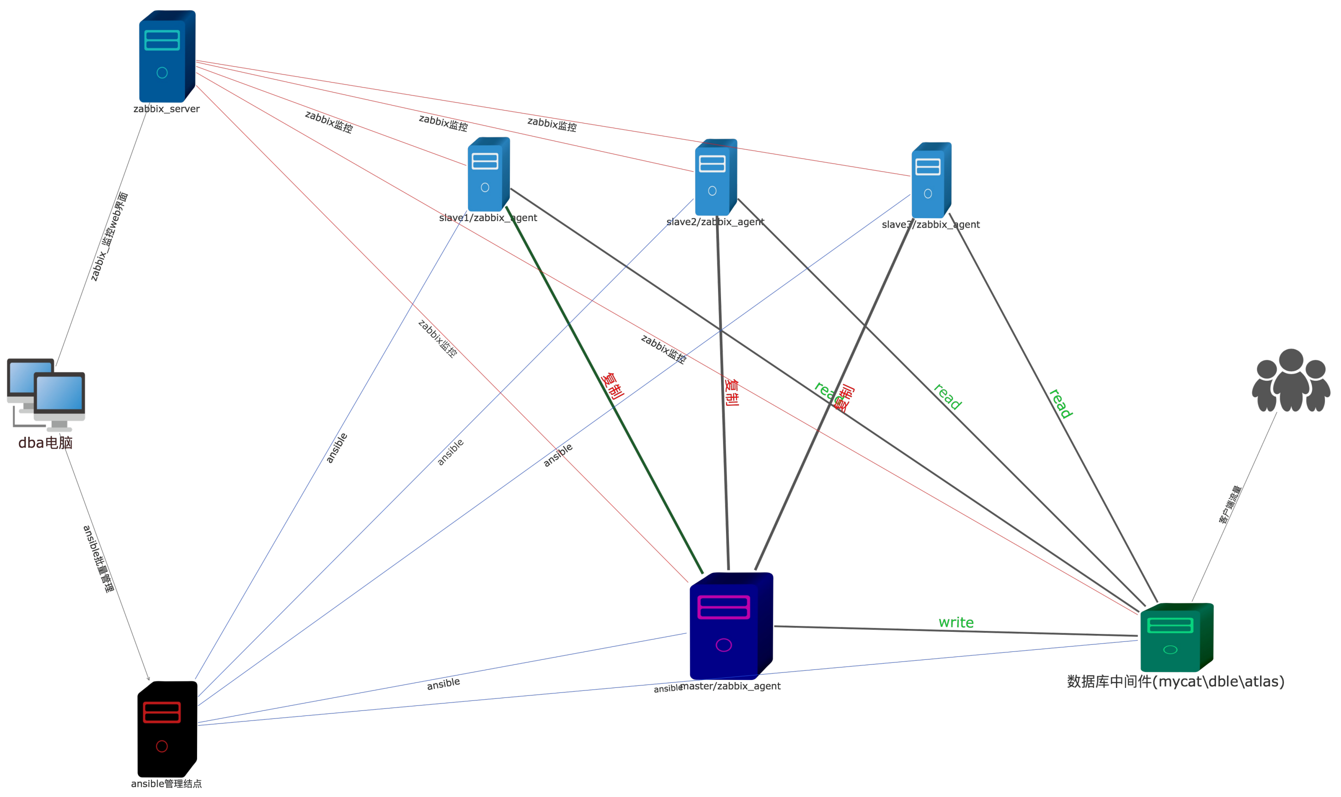
    - 2 自动化监控各类mysql相关环境

```
   高质量的安装好各类mysql环境只是一个好的开始、
```

```
mysqltools不只能在安装这个阶段大大的节约mysql-dba
要花费的时间、
    还能在mysql整个生命周期中监控mysql、做到有问题早
发现、早解决、常见问题自动解决。让dba的时间用到更有
价值的地方。
```

- 3 自动化备份生命周期管理
- 4 深度mysql巡检/优化/自动化故障解决

- mysqltools如何解决问题
  - 1 自动化安装配置功能 mysqltool使用的是国际一流的开源的批量管理工具 ansible: https://www.ansible.com
  - 2 自动化监控mysql功能 mysqltools使用的是国际一流的开源的企业级监控工具zabbix: https://www.zabbix.com
  - 3 动化备份生命周期管理功能 mysqltools使用的是开源的 extrabackup | 和企业版的 meb
  - 4 深度mysql巡检/优化/自动化故障解决功能/监控项的收集功能 mysqltools使用的是自己用python3编码的方式实现的
  - 5 高可用方面mysqltools采用的是mha这个开源解决方案
  - 6 读写分离\分库\分表方面mysqltools 采用的是dble\mycat\atlas这三个开源的解决方案
- mysqltools示意拓扑图



```
1、上面的拓扑图刻画的是一个一主三从的mysql集群、各个mysql客户
端通过中间件连接进集群、zabbix_agent会安装在master/slave/中
间件/zabbix_server/
ansible/所在的主机上用于监控信息的收集、收集到的监控信息会汇总
到zabbix_server、如果监控到出现了问题，zabbix会触发相关操作
的执行以解决相应问题
(mysqltools中已经定义了常见问题的解决操作)、或是发邮件给dba。
由上面可以看出mysql在运行期间遇到的各种问题通常是自动解决的。
2、mysql相关环境的安装是通过上面的ansible主机来批量、自动化完
成的。
mysqltools开发的综指就是为了解放生产力!
```

安装与配置mysqltools

mysqltools 提供的自动化，集中化运维能力是建立在ansible的基础之上，所以安装ansible 就成了使用mysqltools先决条件； ansible 这个软件又是由python写出来的，实际上绝大部分linux操作系统都已经安装上了python2.x，作为一个面向未来的软件 mysqltools并没有使用python2.x而是基于python3.6.x上开发完成的。所以在你安装ansible之前还要先安装上python.3.6.x 好在所有的安装

包mysqltool都已经为你准备好了，mysqltools/deploy/packages/目录下；不只是这样，还把安装流程写成 了脚本，这样你就只要运行一下mysqltools给出的安装脚本就能自动化安装mysqltools了。

安装python

为了方便离线安装python3.6.x 的安装包已经打包到了mysqltools/deploy/packages/python中 注意安装的过程要用root用户

安装python第一步

安装python3.6.x 的相关依赖包

```
yum -y install gcc gcc-c++ libffi libffi-devel zlib
zlib-devel openssl openssl-devel libyaml sqlite-devel
libxml2 libxslt-devel libxml2-devel
```

安装python第二步

安装python-3.6.x

```
cd mysqltools/deploy/packages/python
tar -xvf python-3.6.2.tar.xz -C /tmp/
cd /tmp/Python-3.6.2/
./configure --prefix=/usr/local/python-3.6.2/
make -j 2
make install
cd /usr/local/
ln -s /usr/local/python-3.6.2  python
echo 'export PATH=/usr/local/python/bin/:$PATH' >>
/etc/profile
source /etc/profile
```

自动化安装python

事实上mysqltools/deplay/packages/python/install.sh 脚本中包涵了上面两个步骤的命令可以用root用户直接运它以完成python的安装

```
bash install.sh
```

安装ansible

为了方便离线安装 ansible-2.4.0.0 的安装包和与之相关的依赖包都已经保存到mysqltool/deploy/packages/ansible目录下

安装ansibe第一步解决依赖问题

安装pycparser

```
cd mysqltool/deploy/packages/ansible
tar -xvf pycparser-2.18.tar.gz -C /tmp/
cd /tmp/pycparser-2.18
python3 setup.py build
python3 setup.py install
```

安装six

```
cd mysqltool/deploy/packages/ansible
tar -xvf six-1.11.0.tar.gz -C /tmp/
cd /tmp/six-1.11.0
python3 setup.py build
python3 setup.py install
```

安装asn1crypto

```
cd mysqltool/deploy/packages/ansible
tar -xvf asn1crypto-0.23.0.tar.gz -C /tmp/
cd /tmp/asn1crypto-0.23.0
python3 setup.py build
python3 setup.py install
```

安装idna

```
cd mysqltool/deploy/packages/ansible
tar -xvf idna-2.6.tar.gz -C /tmp/
cd /tmp/idna-2.6
python3 setup.py build
python3 setup.py install
```

安装cryptography

```
cd mysqltool/deploy/packages/ansible
tar -xvf cryptography-2.1.1.tar.gz -C /tmp/
cd /tmp/cryptography-2.1.1/
python3 setup.py build
python3 setup.py install
```

安装pyasn1

```
cd mysqltool/deploy/packages/ansible
tar -xvf pyasn1-0.3.7.tar.gz -C /tmp/
cd /tmp/pyasn1-0.3.7
```

```
python3 setup.py build
python3 setup.py install
```

安装PyNaCl

```
cd mysqltool/deploy/packages/ansible
tar -xvf PyNaCl-1.1.2.tar.gz -C /tmp/
cd /tmp/PyNaCl-1.1.2
python3 setup.py build
python3 setup.py install
```

安装bcrypt

```
cd mysqltool/deploy/packages/ansible
tar -xvf bcrypt-3.1.4.tar.gz -C /tmp/
cd /tmp/bcrypt-3.1.4
python3 setup.py build
python3 setup.py install
```

安装paramiko

```
cd mysqltool/deploy/packages/ansible
tar -xvf paramiko-2.3.1.tar.gz -C /tmp/
cd /tmp/paramiko-2.3.1
python3 setup.py build
python3 setup.py install
```

安装PyYAML

```
cd mysqltool/deploy/packages/ansible
tar -xvf PyYAML-3.12.tar.gz -C /tmp/
cd /tmp/PyYAML-3.12
python3 setup.py build
python3 setup.py install
```

安装MarkupSafe

```
cd mysqltool/deploy/packages/ansible
tar -xvf MarkupSafe-1.0.tar.gz -C /tmp/
cd /tmp/MarkupSafe-1.0
python3 setup.py build
python3 setup.py install
```

安装Jinja2

```
cd mysqltool/deploy/packages/ansible
tar -xvf Jinja2-2.9.6.tar.gz -C /tmp/
cd /tmp/Jinja2-2.9.6
python3 setup.py build
python3 setup.py install
```

安装ansibe第二步安装ansible

```
cd mysqltools/deploy/packages/ansible/
tar -xvf ansible-2.4.0.0.tar.gz -C /tmp/
cd /tmp/ansible-2.4.0.0
python3 setup.py build
python3 setup.py install
```

自动化安装ansible

作为一个着眼于自动化的工具当然是不应该有这么困难的安装方式的，mysqltools为自己写好自动化安装的脚本，注意这个要用root身份运行

```
cd mysqltools/deploy/package/ansible
bash install.sh
```

mysqltools快速入门

在这里我们假设你已经根据上面的步骤完成了 安装python 、安装ansible ； 由于mysqltools在批量管理方面是由ansible来实现的、所以要想正常使用mysqltools就要正确的配置好ansible。 在入门配置中我们以在172.16.192.10上安装mysql为例、用于说明整个配置过程。

配置ansible

- 1 、增加到172.16.192.10主机的互信

  ```
  ssh-copy-id root@172.16.192.10
  ```

- 2 、创建ansible配置文件

  ```
  mkdir /etc/ansible/
  touch /etc/ansible/hosts
  ```

- 3 、172.16.192.10主机相关的配置增加到/etc/ansible/hosts 内容如下

  ```
  cat /etc/ansible/hosts
  ```

```
  cstudio ansible_user=root
ansible_host=172.16.192.10

  在这里我为172.16.192.10起了个别名cstudio、以后在
ansible中用这个别名就行了
```

- 4 、测试ansible有没有配置成功、通过pint cstudio 看有没有成功返回

```
  ansible -m ping cstudio
      cstudio | SUCCESS => {
      "changed": false,
      "failed": false,
      "ping": "pong"
      }
```

- 5 、总结:

```
 由上面的返回可以看到ping 成功了、进一步说明ansible已经
配置好了。
```

下载mysql二进制安装包

```
cd /opt/
wget https://dev.mysql.com/get/Downloads/MySQL-
5.7/mysql-5.7.20-linux-glibc2.12-x86_64.tar.gz
```

配置mysqltools

mysqltools 只有一个全局配置文件mysqltools/config.yaml 、在这里我们假设你把mysqltools保存到了/opt/mysqltools、 那么配置文件的全路径就

是/opt/mysqltools/config.yaml

- 1 、配置 mtls_base_dir

  这个配置项指定的是mysqltools的基准目录、按上面的假设mtls_base_dir应该配置成 /opt/mysqltools/ 注意在mysqltools的配置文件中所有的路径都要心/结束

  ```
    cat /opt/mysqltools/config.yaml | grep
  mtls_base_dir
    mtls_base_dir: /opt/mysqltools/
  ```

- 2 、配置 mysql_packages_dir

  这个配置项指的是你把mysql的二进制安装包保存在了哪里、在上面的步骤中我们把它下载到了/opt/目录下 所以mysql_packages_dir 就要配置成/opt/

  ```
    cat /opt/mysqltools/config.yaml | grep
  mysql_packages_dir
    /opt/
  ```

- 3 、配置 mysql_package

  这个配置项当前mysqltools要使用那个mysql安装包

  ```
    cat /opt/mysqltools/config.yaml | grep
  mysql_package
    mysql-5.7.20-linux-glibc2.12-x86_64.tar.gz
  ```

ansible文档

由于mysqltools是基于ansible开发出为的工具集、所以要熟练的使用mysqltools你要先了解一下ansible

- 1 ansible中文文档：http://www.ansible.com.cn/index.html
- 2 ansible英文文档：http://docs.ansible.com/ansible/latest/index.html

mysqltools功能列表

mysql安装

单实例mysql的安装

- 1 进入mysql工具所在的目录

```
    cd mysqltools/deploy/ansible/mysql/
```

- 2 设置install_single_mysql.yaml文件中的hosts字段的值为你要执行mysql包安装的目标机器

- 3 调用ansible-playbook完成自动化安装过程

```
    ansible-playbook install_single_mysql.yaml
    PLAY [cstudio]
  ************************************************
  ****************************
    TASK [Gathering Facts]
  ************************************************
  ********************
    ok: [cstudio]
    TASK [create mysql user]
  ************************************************
  ******************
    changed: [cstudio]
    TASK [create and config /etc/my.cnf]
  ************************************************
  ******
    changed: [cstudio]
    TASK [transfer mysql install package to remote
  host and unarchive to /usr/local/] *********
    changed: [cstudio]
    TASK [change owner to mysql user]
  ************************************************
  *********
    changed: [cstudio]
    TASK [make link /usr/local/mysql-xx.yy.zz to
  /usr/local/mysql] ****************************
    changed: [cstudio]
    TASK [export mysql share object (*.os)]
  ************************************************
  ***
    changed: [cstudio]
    TASK [load share object]
  ************************************************
  ******************
    changed: [cstudio]
    TASK [export path env variable]
  ************************************************
  ***********
    changed: [cstudio]
    TASK [export path env to /root/.bashrc]
  ************************************************
  ***
    changed: [cstudio]
    TASK [make link /usr/local/mysql-xx.yy.zz to
  /usr/local/mysql] ****************************
    changed: [cstudio]
    TASK [create datadir]
  ************************************************
  *********************
    changed: [cstudio]
    TASK [initialize-insecure]
  ************************************************
```

```
****************
  changed: [cstudio]
  TASK [create libmysqlclient_r.so file for php-
5.6] ****************************************
  changed: [cstudio]
  TASK [create systemd config file]
************************************************
*********
  changed: [cstudio]
  TASK [enable mysqld service]
************************************************
**************
  changed: [cstudio]
  TASK [start mysql(sytemctl)]
************************************************
**************
  changed: [cstudio]
  TASK [config mysql.service start up on boot]
**********************************************
  changed: [cstudio]
  TASK [config sysv start script]
************************************************
***********
  skipping: [cstudio]
  TASK [start mysql(service)]
************************************************
***************
  skipping: [cstudio]
  TASK [config mysql.service start up on boot]
**********************************************
  skipping: [cstudio]
  TASK [transfer sql statement to remonte]
************************************************
**
  changed: [cstudio]
  TASK [make mysql secure]
************************************************
******************
  changed: [cstudio]
  TASK [clear /tmp/ directory]
************************************************
**************
  changed: [cstudio]
  PLAY RECAP
************************************************
********************************
  cstudio                    : ok=21
changed=20   unreachable=0    failed=0
```

- 4 测试mysql数据是否安装成功

```
  [root@cstudio data]# mysql -uroot -pmtls0352
  mysql: [Warning] Using a password on the
command line interface can be insecure.
  Welcome to the MySQL monitor.  Commands end
with ; or \g.
  Your MySQL connection id is 5
  Server version: 5.7.20-log MySQL Community
Server (GPL)

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  affiliates. Other names may be trademarks of
their respective
  owners.

  Type 'help;' or '\h' for help. Type '\c' to
clear the current input statement.

  mysql>
```

- 5 注意事项:

- 1 如果你的目标端操作系统是linux-6.x 而且是最小化安装的情况下会有两个问题出现、原因是缺少selinux-python、numactl 不过可以通过

  ```
  yum -y install selinux-python numactl
  ```

  把它们行安装一下

mysql-group-replication环境的安装

- 1 进入mysql-group-replication工具所在的目录

```
cd mysqltools/deploy/ansible/mysql/
```

- 2 告诉mysqltools你要在哪几台主机上安装mysql-group-replication

> 比如说我要在10.186.19.{17,18,19}这三个结点上安装，那么就要把vars/group_replication.yaml 的内容改成如下

```
mtls_with_mysql_group_replication: 1
mysql_binlog_format: row
mysql_mgr_port: 33060
mysql_mgr_hosts:
    - '10.186.19.17'
    - '10.186.19.18'
    - '10.186.19.19'
```

- 3 把要安装mysql-group-replication的主机分到一个ansible组中

> 比如说把上面3个实例分类到一个组中、那么/etc/ansible/hosts文件的内容如下

```
  [mgr1]
  mrg17 ansible_user=root
ansible_host=10.186.19.17
  mrg18 ansible_user=root
ansible_host=10.186.19.18
  mrg19 ansible_user=root
ansible_host=10.186.19.19
```

- 4 修改mysql-group-replication.yaml文件中的hosts变量为mgr1
- 5 自动化安装mysql-group-replication

```
  ansible-playbook
install_group_replication.yaml
  PLAY [mgr1]
************************************************
**************************
  TASK [Gathering Facts]
************************************************
***************
  ok: [mrg19]
  ok: [mrg17]
  ok: [mrg18]
  TASK [create mysql user]
************************************************
*************
  ok: [mrg17]
  ok: [mrg18]
  ok: [mrg19]
  TASK [create and config /etc/my.cnf]
************************************************
*
  changed: [mrg18]
  changed: [mrg17]
  changed: [mrg19]
  TASK [transfer mysql install package to remote
host and unarchive to /usr/local/] ****
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [change owner to mysql user]
************************************************
****
  changed: [mrg18]
  changed: [mrg17]
  changed: [mrg19]
  TASK [make link /usr/local/mysql-xx.yy.zz to
/usr/local/mysql] ***********************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [export mysql share object (*.os)]
**********************************************
  ok: [mrg18]
  ok: [mrg17]
  ok: [mrg19]
  TASK [load share object]
************************************************
*************
  changed: [mrg18]
  changed: [mrg19]
  changed: [mrg17]
  TASK [export path env variable]
************************************************
******
  ok: [mrg18]
  ok: [mrg19]
  ok: [mrg17]
  TASK [export path env to /root/.bashrc]
**********************************************
  ok: [mrg17]
  ok: [mrg18]
  ok: [mrg19]
  TASK [make link /usr/local/mysql-xx.yy.zz to
/usr/local/mysql] ***********************
```

```
  ok: [mrg17]
  ok: [mrg18]
  ok: [mrg19]
  TASK [create libmysqlclient_r.so file for php-
5.6] ***********************************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [create datadir]
************************************************
****************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [initialize-insecure]
************************************************
***********
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [create systemd config file]
************************************************
****
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [enable mysqld service]
************************************************
*********
  changed: [mrg18]
  changed: [mrg17]
  changed: [mrg19]
  TASK [start mysql(sytemctl)]
************************************************
*********
  changed: [mrg18]
  changed: [mrg17]
  changed: [mrg19]
  TASK [config mysql.service start up on boot]
```

```
*****************************************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [config sysv start script]
************************************************
******
  skipping: [mrg17]
  skipping: [mrg18]
  skipping: [mrg19]
  TASK [start mysql(service)]
************************************************
**********
  skipping: [mrg17]
  skipping: [mrg18]
  skipping: [mrg19]
  TASK [config mysql.service start up on boot]
*****************************************
  skipping: [mrg17]
  skipping: [mrg18]
  skipping: [mrg19]
  TASK [transfer sql statement to remonte]
*********************************************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [make config mgr]
************************************************
***************
  changed: [mrg17]
  changed: [mrg19]
  changed: [mrg18]
  TASK [remove temp file
/tmp/config_mysql_group_replication.sql]
**********************
  changed: [mrg17]
  changed: [mrg18]
  changed: [mrg19]
  TASK [transfer sql statement to remonte]
```

```
*********************************************
  skipping: [mrg18]
  skipping: [mrg19]
  ok: [mrg17]
  TASK [make mysql secure]
************************************************
*************
  skipping: [mrg18]
  skipping: [mrg19]
  changed: [mrg17]
  TASK [remove temp file
/tmp/make_mysql_secure.sql]
***********************************
  skipping: [mrg18]
  skipping: [mrg19]
  changed: [mrg17]
  PLAY RECAP
************************************************
***************************
  mrg17                     : ok=24
changed=17   unreachable=0    failed=0
  mrg18                     : ok=21
changed=15   unreachable=0    failed=0
  mrg19                     : ok=21
changed=15   unreachable=0    failed=0
```

- 6 查看各结点状态、确认mysql-group-replication正确的安装了

```
  mysql> select * from
performance_schema.replication_group_members;
  +---------------------------+-----------------
---------------------+-------------+-----------
-+--------------+
  | CHANNEL_NAME              | MEMBER_ID
| MEMBER_HOST | MEMBER_PORT | MEMBER_STATE |
  +---------------------------+-----------------
---------------------+-------------+-----------
```

```
-+---------------+
  | group_replication_applier | 616fc577-c78c-
11e7-bd86-1e1b3511358e | mtsl18       |
3306 | ONLINE       |
  | group_replication_applier | 624b4142-c78c-
11e7-9a2a-9a17854b700d | mtls17       |
3306 | ONLINE       |
  | group_replication_applier | 643af870-c78c-
11e7-8ffa-8a7c439b72d9 | mtls19       |
3306 | ONLINE       |
  +---------------------------+-----------------
---------------------+-------------+------------
-+---------------+
  3 rows in set (0.00 sec)
```

multi-source-replicationg环境的安装

- 1 把要安装multi-source-replication的各个主机加入到ansible的一个组中

```
  cat /etc/ansible/hosts
  [multi_source]
  mtls16 ansible_user=root
ansible_host=10.186.19.16
  mtls18 ansible_user=root
ansible_host=10.186.19.18
  mtls19 ansible_user=root
ansible_host=10.186.19.19
```

- 2 修改mysqltools/deploy/ansible/mysql/vars/multi_source_replication.yaml这个配置文件 这样mysqltools时就知道那些主机是master角色、那个主机是slave角色了。

```
  cat multi_source_replication.yaml
  #master_ips 定义多个master主机ip组成的列表
  master_ips:
   - '10.186.19.16'
   - '10.186.19.18'

  #定义slave的ip
  slave_ip: '10.186.19.19'
```

- 3 修改 mysqltools/deploy/ansible/mysql/install_multi_source_replication.yaml文件中的hosts:变量为 1 中 定义好的组名

```
  cat install_multi_source_replication.yaml |
grep hos
   - hosts: multi_source
```

- 4 自动化安装multi_source_replication复制环境

```
  ansible-playbook
install_multi_source_replication.yaml
  PLAY [multi_source]
************************************************
*******************************
  TASK [Gathering Facts]
************************************************
****************************
  ok: [mtls16]
  ok: [mtls19]
  ok: [mtls18]
  TASK [create mysql user]
************************************************
**************************
```

```
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [create and config /etc/my.cnf]
************************************************
**************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [transfer mysql install package to remote
host and unarchive to /usr/local/]
*****************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [change owner to mysql user]
************************************************
*****************
  changed: [mtls18]
  changed: [mtls16]
  changed: [mtls19]
  TASK [make link /usr/local/mysql-xx.yy.zz to
/usr/local/mysql]
************************************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [export mysql share object (*.os)]
************************************************
***********
  ok: [mtls18]
  ok: [mtls19]
  changed: [mtls16]
  TASK [load share object]
************************************************
**************************
  changed: [mtls18]
  changed: [mtls19]
  changed: [mtls16]
  TASK [export path env variable]
************************************************
*******************
  ok: [mtls16]
  ok: [mtls18]
  ok: [mtls19]
  TASK [export path env to /root/.bashrc]
************************************************
***********
  changed: [mtls16]
  ok: [mtls18]
  ok: [mtls19]
  TASK [make link /usr/local/mysql-xx.yy.zz to
/usr/local/mysql]
************************************
  ok: [mtls18]
  changed: [mtls16]
  ok: [mtls19]
  TASK [create libmysqlclient_r.so file for php-
5.6]
************************************************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [create datadir]
************************************************
*****************************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [initialize-insecure]
************************************************
************************
  changed: [mtls18]
  changed: [mtls19]
  changed: [mtls16]
  TASK [create systemd config file]
************************************************
*****************
```

```
  changed: [mtls18]
  changed: [mtls16]
  changed: [mtls19]
  TASK [enable mysqld service]
************************************************
**********************
  changed: [mtls18]
  changed: [mtls19]
  changed: [mtls16]
  TASK [start mysql(sytemctl)]
************************************************
**********************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [config mysql.service start up on boot]
************************************************
******
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  TASK [config sysv start script]
************************************************
*******************
  skipping: [mtls16]
  skipping: [mtls18]
  skipping: [mtls19]
  TASK [start mysql(service)]
************************************************
***********************
  skipping: [mtls16]
  skipping: [mtls18]
  skipping: [mtls19]
  TASK [config mysql.service start up on boot]
************************************************
******
  skipping: [mtls16]
  skipping: [mtls18]
  skipping: [mtls19]
  TASK [transfer sql to remonte host]
************************************************
***************
  ok: [mtls18]
  changed: [mtls16]
  changed: [mtls19]
  TASK [create multi source replication user on
master / start slave on slave]
**********************
  changed: [mtls18]
  changed: [mtls16]
  changed: [mtls19]
  TASK [clear temp file
/tmp/config_mutli_source_replication.sql]
***********************************
  changed: [mtls16]
  changed: [mtls18]
  changed: [mtls19]
  PLAY RECAP
************************************************
****************************************
  mtls16                     : ok=21
changed=19   unreachable=0    failed=0
  mtls18                     : ok=21
changed=15   unreachable=0    failed=0
  mtls19                     : ok=21
changed=16   unreachable=0    failed=0
```

- 5 验证一下slave上两条复制通道是否都正常:

```
  Welcome to the MySQL monitor.  Commands end
with ; or \g.
  Your MySQL connection id is 24
  Server version: 5.7.20-log MySQL Community
Server (GPL)

  Copyright (c) 2000, 2017, Oracle and/or its
```

```
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  affiliates. Other names may be trademarks of
their respective
  owners.

  Type 'help;' or '\h' for help. Type '\c' to
clear the current input statement.

  mysql> show slave status \G
  *************************** 1. row
***************************
                 Slave_IO_State: Waiting for
master to send event
                    Master_Host: 10.186.19.16
                    Master_User: rple_user
                    Master_Port: 3306
                  Connect_Retry: 60
                Master_Log_File: mysql-
bin.000002
            Read_Master_Log_Pos: 150
                 Relay_Log_File: mtls19-relay-
bin-master1.000002
                  Relay_Log_Pos: 355
          Relay_Master_Log_File: mysql-
bin.000002
               Slave_IO_Running: Yes
              Slave_SQL_Running: Yes
              ..........
                  Auto_Position: 1
           Replicate_Rewrite_DB:
                   Channel_Name: master1
  *************************** 2. row
***************************
                 Slave_IO_State: Waiting for
master to send event
                    Master_Host: 10.186.19.18
```

```
                     Master_User: rple_user
                     Master_Port: 3306
                   Connect_Retry: 60
                 Master_Log_File: mysql-
bin.000002
             Read_Master_Log_Pos: 150
                  Relay_Log_File: mtls19-relay-
bin-master2.000002
                   Relay_Log_Pos: 355
           Relay_Master_Log_File: mysql-
bin.000002
                Slave_IO_Running: Yes
               Slave_SQL_Running: Yes
               ..........
                   Auto_Position: 1
            Replicate_Rewrite_DB:
                    Channel_Name: master2
```

mysql中间件

mycat读写分离

mycat是一款非常优秀的中间件、如果要自动化完成mycat分库分表的配置基本上不可能的、这个只能是“人工智能”了；但是读写分离的相对简单mysqltool目前只能完成读写分离的配置

- 1、***配置vars/var_mycat.yaml***

> vars/var_mycat.yaml 这个配置文件中的配置项，是用于说明整个读写分离集群逻辑构架的

```
master_ip: "10.186.19.17"
#master_ip 用于指定集群的vip / 或主库的ip(如果你没有vip的话)

slave_ips:
 - "10.186.19.18"
 - "10.186.19.19"
 - "10.186.19.20"
#slave_ips 从库的ip

schemas:
 - "appdb"
 - "blogdb"

#schemas 要导出来的schema
```

- 2、***修改install_mycat.yaml中的host为目标主机***

> ansible-playbook是通过hosts属性来指定目标主机的

```
---
 - hosts: cstudio
   # 这样就表示在cstudio主机上安装mycat
   remote_user: root
   become_user: yes
   vars_files:
    - ../../../config.yaml
    - vars/var_mycat.yaml
```

- 3、 ***执行安装***

```
ansible-playbook install_mycat.yaml

PLAY [cstudio]
************************************************
******************************************

TASK [Gathering Facts]
************************************************
**********************************
```

```
ok: [cstudio]

TASK [install java-1.7.0-openjdk]
************************************************
***********************
ok: [cstudio]

TASK [create mycat user]
************************************************
********************************
changed: [cstudio]

TASK [trasfer mycat-server-1.6.5-linux.tar.gz to
remonte host]
******************************************
changed: [cstudio]

TASK [export MYCAT_HOME env to /etc/profile]
************************************************
************
ok: [cstudio]

TASK [config schema.xml]
************************************************
********************************
changed: [cstudio]

TASK [config server.xml]
************************************************
********************************
changed: [cstudio]

TASK [transfer start_mycat.sh to remonte /tmp/]
************************************************
*********
changed: [cstudio]

TASK [start mycat]
************************************************
```

```
**************************************
changed: [cstudio]

TASK [remove start_mycat.sh]
************************************************
****************************
changed: [cstudio]

PLAY RECAP
************************************************
**********************************************
cstudio                    : ok=10   changed=7
unreachable=0    failed=0
```

- 4、***测试mycat是否正常工作***

```
mysql -uappuser -pmtls0352 -h10.186.19.17 -P8066
mysql: [Warning] Using a password on the command
line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with
; or \g.
Your MySQL connection id is 1
Server version: 5.7.200-mycat-1.6.5-release-
20171117203123 MyCat Server (OpenCloundDB)

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their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to
clear the current input statement.
```

```
mysql> show databases;
+-----------+
| DATABASE |
+-----------+
| appdb     |
| blogdb    |
+-----------+
2 rows in set (0.01 sec)
mysql> use appdb;
Reading table information for completion of
table and column       names
You can turn off this feature to get a quicker
startup with -A

Database changed
mysql> show tables;
+-----------------+
| Tables_in_appdb |
+-----------------+
| t               |
+-----------------+
1 row in set (0.00 sec)

mysql> insert into t(x,y) values(2,2);
Query OK, 1 row affected (0.23 sec)
```

被控主机上的python安装

这里介绍的python的安装与前面介绍的安装python所面向的问题是不一样的、安装python是为了 在主控机上安装ansible,mysqltools才安装的python；这里介绍的python安装是在已经安装完成ansible之后，在被控主机上安装 python。之所以要在被控机上安装python是因为mysqltools的大多数功能是用python写的，比如对mysql进行监控时，mysql各项 指标的收集工作是通过python语言来实现的。

- 1 进入安装python的playbook所在的目录

```
  cd mysqltools/deploy/ansible/python
```

- 2 修改install_python.yaml文件中的hosts变量为你要安装的主机
- 3 执行安装

```
  ansible-playbook install_python.yaml
  PLAY [cstudio]
************************************************
************************
  TASK [Gathering Facts]
************************************************
****************
  ok: [cstudio]
  TASK [install gcc]
************************************************
********************
  ok: [cstudio]
  TASK [install gcc-c++]
************************************************
****************
  ok: [cstudio]
  TASK [install libyaml-devel]
************************************************
**********
  ok: [cstudio]
  TASK [install libffi-devel]
************************************************
***********
  ok: [cstudio]
  TASK [install zlib-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install openssl-devel]
************************************************
```

```
**********
  ok: [cstudio]
  TASK [install sqlite-devel]
************************************************
***********
  ok: [cstudio]
  TASK [install libxslt-devel]
************************************************
**********
  ok: [cstudio]
  TASK [install libxml2-devel]
************************************************
**********
  ok: [cstudio]
  TASK [transfer python-3.6.2.tar.x zpackage to
remonte host] ***************************
  changed: [cstudio]
  TASK [transfer python install script to
remonte host /tmp/] ***************************
  changed: [cstudio]
  TASK [install python]
************************************************
*****************
  changed: [cstudio]
  TASK [create link file]
************************************************
***************
  changed: [cstudio]
  TASK [export path env variable(/etc/profile)]
*****************************************
  ok: [cstudio]
  TASK [export path env variable(/root/.bashrc)]
****************************************
  ok: [cstudio]
  TASK [remove /tmp/install_python.sh]
************************************************
**
  changed: [cstudio]
  TASK [remove /tmp/Python-3.6.2]
```

```
************************************************
*******
  changed: [cstudio]
  TASK [transfer mysql-connector-python-
2.1.5.tar.gz to remonte host]
*******************
  ok: [cstudio]
  TASK [transfer mysql-connector-python install
script to remonte host] *****************
  ok: [cstudio]
  TASK [install mysql-connector-python]
************************************************
*
  changed: [cstudio]
  TASK [remove
tmp/install_mysql_connector_python.sh]
***********************************
  ok: [cstudio]
  PLAY RECAP
************************************************
****************************
  cstudio                    : ok=22   changed=7
unreachable=0    failed=0
```

- 4 测试python3有没有安装成功

```
  python3
  Python 3.6.2 (default, Nov  3 2017, 14:09:03)
  [GCC 4.8.5 20150623 (Red Hat 4.8.5-4)] on
linux
  Type "help", "copyright", "credits" or
"license" for more information.
  >>> import mysql
  >>> print("hello mtls")
  hello mtls
  >>>
```

- 5 注意事项

> 由于mysqltools主要是解决mysql相关的问题、解决问题用到的语言是python、目前mysql官方的python连接mysql驱动 包就是mysql-connector-python 所以mysqltools会在安装python的同时也把这个包也安装上；当然你也可以通过设置 std_vars.yaml配置文件中 mtls_with_mysql_conntor_python的值为0 来禁止这一操作

mysql监控环境的安装

对于mysql的监控mysqltools采用国际一流的开源解决方案(zabbix)来实现、各项监控指标会由zabbix_agent完成收集、并发往zabbix_server、在zabbix_server收到数据后会做一些动作如：数据超过事先设定阈值时会告警，对于每一项收到到的数据zabbix_server都 会把它保存到zabbix自用的后台的数据库中；zabbix为了方便使用还给用户配了一个web界面；当然这个web界面的所有数据都来自于zabbix自用的后台的数据库。这里的介绍有些片面，只是因为我在这里想表达的重点是zabbix环境的建设是在**LAMP**的基础上搞出来的；所以要建设zabbix监控环境 就要先把**LAMP**搭建起来。

安装zabbix自用的后台mysql数据库

这个可以参照 单机实例mysql的安装

httpd的安装

mysqltools已经把httpd的源码包都打包进来了，只要简单的两步就能完成httpd的安装

- 1 进入安装httpd的playbook所在的目录

```
cd mysqltools/deploy/ansible/httpd/
```

- 2 修改install_httpd.yaml文件中的hosts变量为你要安装的主机

- 3 执行安装

```
  ansible-playbook install_httpd.yaml
  PLAY [cstudio]
************************************************
****************************
  TASK [Gathering Facts]
************************************************
********************
  ok: [cstudio]
  TASK [install gcc]
************************************************
************************
  ok: [cstudio]
  TASK [install gcc-c++]
************************************************
********************
  ok: [cstudio]
  TASK [install pcre-devel]
************************************************
*****************
  ok: [cstudio]
  TASK [openssl-devel]
************************************************
**********************
  ok: [cstudio]
  TASK [expat-devel]
************************************************
************************
  ok: [cstudio]
  TASK [transfer apr-1.6.2.tar.gz to remote
host]
*******************************************
  changed: [cstudio]
  TASK [copy install script to remote]
************************************************
******
  changed: [cstudio]
  TASK [install apr]
************************************************
************************
  changed: [cstudio]
  TASK [remove /tmp/install_apr.sh]
************************************************
*********
  changed: [cstudio]
  TASK [remove /tmp/apr-1.6.2]
************************************************
**************
  changed: [cstudio]
  TASK [transfer apr-util-1.6.0.tar.gz to remote
host] **************************************
  changed: [cstudio]
  TASK [copy install script to remote]
************************************************
******
  changed: [cstudio]
  TASK [install apr_util]
************************************************
*******************
  changed: [cstudio]
  TASK [clear /tmp/ directory]
************************************************
**************
  changed: [cstudio]
  TASK [clear /tmp/ directory]
************************************************
**************
  changed: [cstudio]
  TASK [copy httpd-2.4.28.tar.gz to remonte
host]
*******************************************
  changed: [cstudio]
  TASK [copy install scripts to remonte host]
***********************************************
  changed: [cstudio]
  TASK [install httpd]
```

```
************************************************
**********************
  changed: [cstudio]
  TASK [copy httpd.conf to remonte host]
************************************************
****
  changed: [cstudio]
  TASK [config sysctl]
************************************************
**********************
  changed: [cstudio]
  TASK [start httpd]
************************************************
************************
  changed: [cstudio]
  TASK [start httpd]
************************************************
************************
  skipping: [cstudio]
  TASK [config sysv start script(only linux-6)]
*********************************************
  skipping: [cstudio]
  TASK [config httpd start up on boot(only
linux-6)]
****************************************
  skipping: [cstudio]
  TASK [start httpd(only linux-6)]
************************************************
**********
  skipping: [cstudio]
  TASK [remove /tmp/install_httpd.sh]
************************************************
*******
  changed: [cstudio]
  TASK [remove /tmp/httpd-2.4.28.tar.gz]
************************************************
****
  changed: [cstudio]
  PLAY RECAP
```

```
****************************************************************************
  cstudio                    : ok=24
changed=18   unreachable=0    failed=0
```

php的安装

mysqltools会把php安装成httpd的一个模块

- 1 进入到安装php的playbook的目录

```
  cd mysqltools/deploy/ansible/php
```

- 2 修改install_php.yaml文件中的hosts变量为你要安装的主机

- 3 执行安装

```
  ansible-playbook install_php.yaml
  PLAY [cstudio]
**************************************************************************
  TASK [Gathering Facts]
******************************************************************
  ok: [cstudio]
  TASK [install gcc]
**********************************************************************
  ok: [cstudio]
  TASK [install gcc-c++]
******************************************************************
  ok: [cstudio]
  TASK [install bzip2-devel]
************************************************
```

```
****************
  changed: [cstudio]
  TASK [install libjpeg-devel]
************************************************
**************
  changed: [cstudio]
  TASK [install libpng-devel]
************************************************
***************
  changed: [cstudio]
  TASK [install freetype-devel]
************************************************
*************
  changed: [cstudio]
  TASK [install freetype-devel]
************************************************
*************
  ok: [cstudio]
  TASK [copy and untar php-5.6.31.tar.gz to
remonte host]
***********************************
  changed: [cstudio]
  TASK [copy install_php.sh to remonte host]
************************************************
  changed: [cstudio]
  TASK [install php]
************************************************
************************
  changed: [cstudio]
  TASK [copy php.ini to remote]
************************************************
*************
  changed: [cstudio]
  TASK [remove /tmp/install_php.sh]
************************************************
*********
  changed: [cstudio]
  TASK [remove /tmp/php-5.6.31]
************************************************
```

```
*************
  changed: [cstudio]
  PLAY RECAP
************************************************
********************************
  cstudio                        : ok=14
changed=10   unreachable=0    failed=0
```

zabbix-server的安装

- 1 进入安装zabbix-server的目录

```
  cd mysqltools/deplay/ansible/zabbix/
```

- 2 修改nstall_zabbix_server.yaml 文件中的hosts变量为你要安装的主机

- 3 执行安装脚本

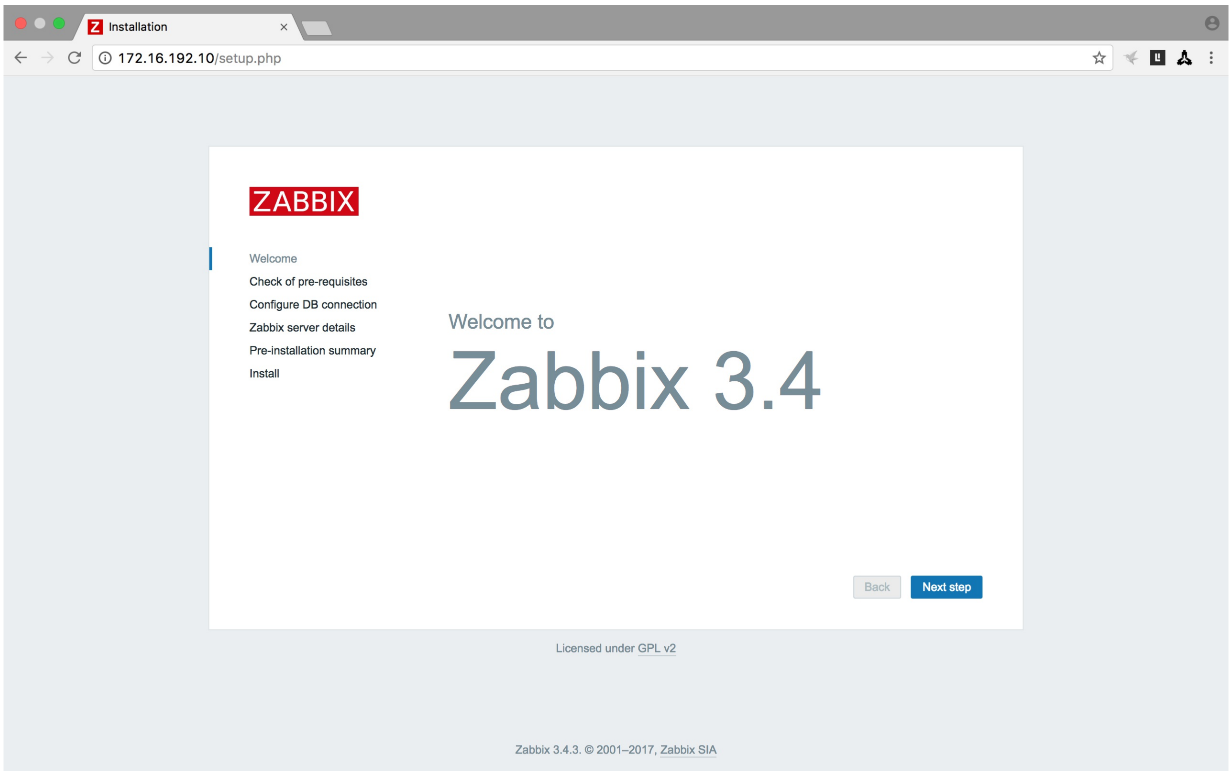
```
  ansible-playbook install_zabbix_server.yaml
  PLAY [cstudio]
************************************************
****************************
  TASK [Gathering Facts]
************************************************
********************
  ok: [cstudio]
  TASK [add zabbix user to system]
************************************************
**********
  ok: [cstudio]
  TASK [remove
/usr/local/httpd/htdocs/index.html]
******************************************
  ok: [cstudio]
  TASK [install gcc]
```

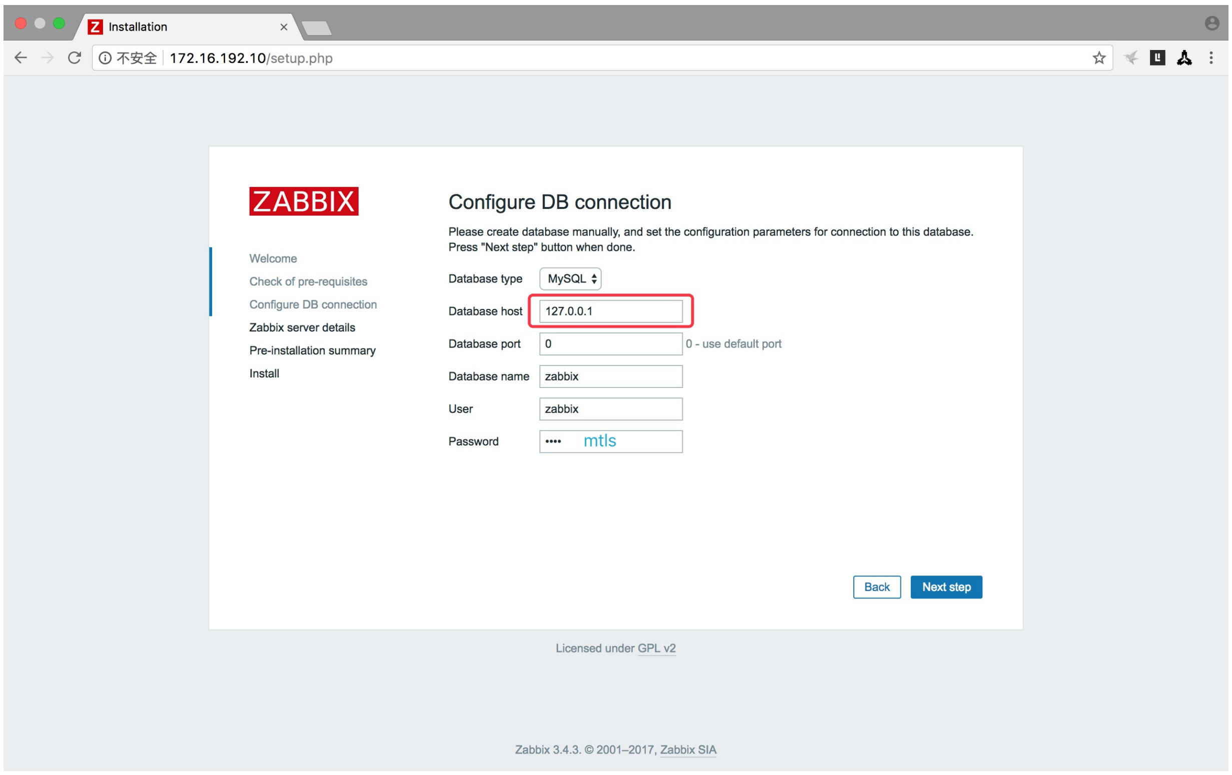
```
************************************************
************************
  ok: [cstudio]
  TASK [install gcc-c++]
************************************************
********************
  ok: [cstudio]
  TASK [install libxml2-devel]
************************************************
**************
  ok: [cstudio]
  TASK [install curl-devel]
************************************************
*****************
  ok: [cstudio]
  TASK [install unixODBC-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install net-snmp-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install OpenIPMI-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install libevent-devel]
************************************************
*************
  ok: [cstudio]
  TASK [transfer zabbix install package to
remote host and unarchive to /tmp/]
**************
  changed: [cstudio]
  TASK [transfer install script to remonte host]
********************************************
  ok: [cstudio]
  TASK [install zabbix_server_node]
```

```
************************************************
*********
  changed: [cstudio]
  TASK [copy zabbix web-site file to
/usr/local/httpd/htdocs/]
******************************
  changed: [cstudio]
  TASK [change /usr/local/httpd/htdocs/ owner
and group] ************************************
  changed: [cstudio]
  TASK [change owner to zabbix user]
************************************************
********
  changed: [cstudio]
  TASK [make link]
************************************************
**************************
  changed: [cstudio]
  TASK [transfer zabbix config file to remonte
host] ****************************************
  changed: [cstudio]
  TASK [transfer zabbix database init script to
remonte host] *******************************
  changed: [cstudio]
  TASK [init zabbix database]
************************************************
***************
  changed: [cstudio]
  TASK [remove /tmp/install_zabbix_server.sh]
***********************************************
  changed: [cstudio]
  TASK [remove /tmp/zabbix-3.4.3]
************************************************
***********
  changed: [cstudio]
  TASK [remove /tmp/init_zabbix_database.sql]
***********************************************
  changed: [cstudio]
  TASK [stop httpd(linux-6)]
```

```
************************************************
****************
  skipping: [cstudio]
  TASK [stop httpd(linux-7)]
************************************************
****************
  ok: [cstudio]
  TASK [start zabbix-server]
************************************************
****************
  changed: [cstudio]
  TASK [start zabbix-agent(on zabbix-server
host)]
******************************************
  changed: [cstudio]
  PLAY RECAP
************************************************
********************************
  cstudio                   : ok=27
changed=14   unreachable=0    failed=0
```

- 4 通过浏览器测试zabbix-server是否安装成功




Installation

不安全 | 172.16.192.10/setup.php

ZABBIX

Welcome
Check of pre-requisites
Configure DB connection
Zabbix server details
Pre-installation summary
Install

Configure DB connection

Please create database manually, and set the configuration parameters for connection to this database.
Press "Next step" button when done.

Database type	MySQL
Database host	127.0.0.1
Database port	0 — 0 - use default port
Database name	zabbix
User	zabbix
Password	•••• mtls

Back | Next step

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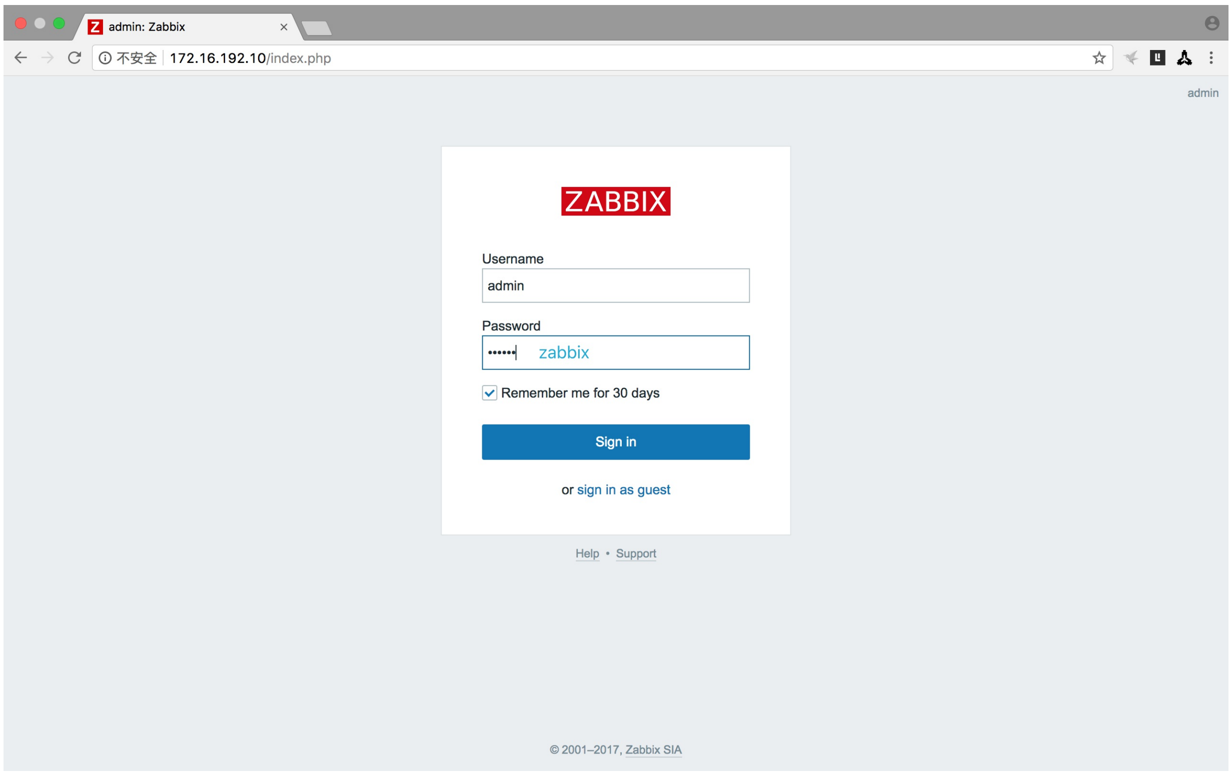
admin: Zabbix

不安全 | 172.16.192.10/index.php

admin

ZABBIX

Username: admin

Password: •••••• zabbix

✓ Remember me for 30 days

Sign in

or sign in as guest

Help • Support

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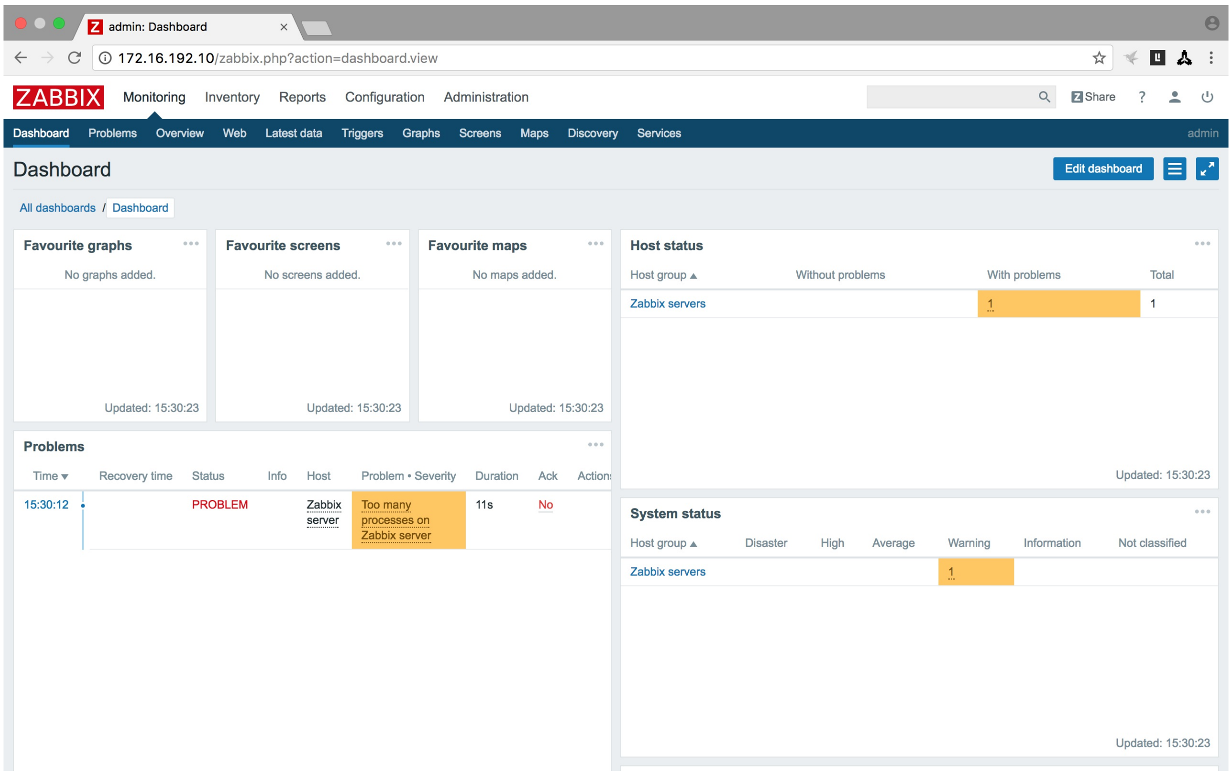

Dashboard

Favourite graphs
No graphs added.
Updated: 15:30:23

Favourite screens
No screens added.
Updated: 15:30:23

Favourite maps
No maps added.
Updated: 15:30:23

Host status

Host group ▲	Without problems	With problems	Total
Zabbix servers		1	1

Updated: 15:30:23

Problems

Time ▾	Recovery time	Status	Info	Host	Problem • Severity	Duration	Ack	Actions
15:30:12		PROBLEM		Zabbix server	Too many processes on Zabbix server	11s	No	

System status

Host group ▲	Disaster	High	Average	Warning	Information	Not classified
Zabbix servers				1		

Updated: 15:30:23

zabbix-agent的安装

- 1 进入安装zabbix-agent的目录

```
cd mysqltools/deplay/ansible/zabbix/
```

- 2 修改nstall_zabbix_agent.yaml 文件中的hosts变量为你要安装的主机，由于zabbix_agent还要与zabbix_server间进行 通信，所以在安装zabbix_agent时还要告诉它zabbix-server的IP地址，这个地址值可以在std_vars.yaml文件中的zabbix_server_ip配置项指定。

- 3 执行安装脚本

```
ansible-playbook install_zabbix_agent.yaml
PLAY [cstudio]
************************************************
****************************
TASK [Gathering Facts]
************************************************
```

```
********************
  ok: [cstudio]
  TASK [add zabbix user to system]
************************************************
**********
  ok: [cstudio]
  TASK [install gcc]
************************************************
************************
  ok: [cstudio]
  TASK [install gcc-c++]
************************************************
********************
  ok: [cstudio]
  TASK [install libxml2-devel]
************************************************
**************
  ok: [cstudio]
  TASK [install curl-devel]
************************************************
*****************
  ok: [cstudio]
  TASK [install unixODBC-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install net-snmp-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install OpenIPMI-devel]
************************************************
*************
  ok: [cstudio]
  TASK [install libevent-devel]
************************************************
*************
  ok: [cstudio]
  TASK [transfer zabbix install package to
remote host and unarchive to /tmp/]
**************
  changed: [cstudio]
  TASK [transfer install script to remonte host]
********************************************
  changed: [cstudio]
  TASK [install zabbix_agent_node]
************************************************
**********
  changed: [cstudio]
  TASK [change owner to zabbix user]
************************************************
********
  changed: [cstudio]
  TASK [make link]
************************************************
**************************
  changed: [cstudio]
  TASK [transfer zabbix config file to remonte
host] ****************************************
  changed: [cstudio]
  TASK [remove /tmp/install_zabbix_agent.sh]
************************************************
  changed: [cstudio]
  TASK [remove /tmp/zabbix-3.4.3]
************************************************
***********
  changed: [cstudio]
  TASK [start zabbix-agent]
************************************************
*****************
  changed: [cstudio]
  PLAY RECAP
************************************************
********************************
  cstudio                    : ok=19   changed=9
unreachable=0    failed=0
```

- 4 查看abbix-agent 是否正常运行

```
  ps -ef | grep zabbix
  zabbix    89267      1  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd
  zabbix    89268  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
collector [idle 1 sec]
  zabbix    89269  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
listener #1 [waiting for connection]
  zabbix    89270  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
listener #2 [waiting for connection]
  zabbix    89271  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
listener #3 [waiting for connection]
  zabbix    89272  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
active checks #1 [idle 1 sec]
  zabbix    89273  89267  0 15:46 ?
00:00:00 /usr/local/zabbix/sbin/zabbix_agentd:
active checks #2 [idle 1 sec]
```

mysql监控程序monitor

- 1 monitor 监控mysql举例:

```
  cd mysqltools/mysqltoolspy/
  python3 monitor.py -s 10.186.19.17 -P3306 -
umonitor -pmtls0352  InnodbLogWaits
  0
```

- 2 monitory 已经实现的监控项列表

监控项名	*简介*	*采集方式*
	mysql配置(variable)相关的监控项列表	如果人为修改了mysql参 了问题、那么对关键参数 定位问题
	-- ServerID	对应server_id
	-- BaseDir	对应basedir
	-- DataDir	对应datadir
	-- Port	对应port
	-- CharacterSetServer	对应character_set_ser
	-- Socket	对应socket
	-- ReadOnly	对应readonly
	-- SkipNameResolve	对应skip_name_resolv
	-- LowerCaseTableNames	对应lower_case_table_
	-- ThreadCacheSize	对应thread_cache_size 如果池有空闲的线程、那 独创建新的线程了
	-- TableOpenCache	对应table_open_cache
	-- TableDefinitionCache	对应table_definition_c
	-- TableOpenCacheInstances	对应table_open_cache
	-- MaxConnections	对应max_connections
	-- BinlogFormat	对应binlog_format

-- LogBin	对应log_bin
-- BinlogRowsQueryLogEvents	对应binlog_rows_quer
-- LogSlaveUpdates	对应log_slave_update
-- ExpireLogsDays	对应expire_logs_days
-- BinlogCacheSize	对应binlog_cache_size
-- SyncBinlog	对应sync_binlog
-- ErrorLog	对应error_log
-- GtidMode	对应gtid_mode
-- EnforceGtidConsistency	对应enforce_gtid_con
-- MasterInfoRepository	对应master_info_repo
-- RelayLogInfoRepository	对应relay_log_info_re
-- SlaveParallelType	对应slave_parallel_typ
-- SlaveParallelWorkers	对应slave_parallel_wo
-- InnodbDataFilePath	对应innodb_data_file_
-- InnodbTempDataFilePath	对应innodb_temp_dat
-- InnodbBufferPoolFilename	对应innodb_buffer_pc
-- InnodbLogGroupHomeDir	对应innodb_log_grou
-- InnodbLogFilesInGroup	对应innodb_log_file_i
-- InnodbLogFileSize	对应innodb_log_file_s
-- InnodbFileformat	对应innodb_fileforma
-- InnodbFilePerTable	对应innodb_file_per_t
-- InnodbOnlineAlterLogMaxSize	对应innodb_online_Al

-- InnodbOpenFiles	对应innodb_open_file
-- InnodbPageSize	对应innodb_page_size
-- InnodbThreadConcurrency	对应innodb_thread_cc
-- InnodbReadIoThreads	对应innodb_read_io_tl
-- InnodbWriteIoThreads	对应innodb_write_io_t
-- InnodbPurgeThreads'	对应innodb_purge_thı
-- InnodbLockWaitTimeout	对应innodb_lock_wait
-- InnodbSpinWaitDelay	对应innodb_spin_wait
-- InnodbAutoincLockMode	对应innodb_autoinc_l
-- InnodbStatsAutoRecalc	对应innodb_stats_aut
-- InnodbStatsPersistent	对应innodb_stats_per
-- InnodbStatsPersistentSamplePages	对应 innodb_stats_persiste
-- InnodbBufferPoolInstances	对应innodb_buffer_pc
-- InnodbAdaptiveHashIndex	对应innodb_adaptive_
-- InnodbChangeBuffering	对应innodb_change_b
-- InnodbChangeBufferMaxSize	对应innodb_change_b
-- InnodbFlushNeighbors	对应innodb_flush_nei
-- InnodbFlushMethod	对应innodb_flush_me
-- InnodbDoublewrite	对应innodb_doublewr
-- InnodbLogBufferSize	对应innodb_log_buffe
-- InnodbFlushLogAtTimeout	对应innodb_flushLog_
-- InnodbFlushLogAtTrxCommit	对应innodb_flushLog_

-- InnodbBufferPoolSize	对应innodb_buffer_pc
-- Autocommit	对应autocommit
-- InnodbOldBlocksPct	对应innodb_lld_block
-- InnodbOldBlocksTime	对应innodb_old_block
-- InnodbReadAheadThreshold	对应innodb_read_ahe
-- InnodbRandomReadAhead	对应innodb_random_r
-- InnodbBufferPoolDumpPct	对应innodb_buffer_pc
-- InnodbBufferPoolDumpAtShutdown	对应 innodb_buffer_pool_c
*********************************	
mysql状态(status)相关监控	通过对status进行监控 性能表现
-- AbortedClients	对应aborted_clients 、 连接没有被正常关闭的
-- AbortedConnects	对应borted_connects server端的次数
-- BinlogCacheDiskUse	对应binlog_cache_disl 件存储事务语句的次数
-- BinlogCacheUse	对应binlog_cache_use binlog_cache存储事务
-- BinlogStmtCacheDiskUse	对应binlog_stmt_cach 务语句使用临时文件存
-- BinlogStmtCacheUse	对应binlog_stmt_cach 句使用binlog_cache存

-- BytesReceived	对应bytes_received、╱ 数
-- BytesSent	对应bytes_sent、发送纟
-- ComBegin	对应com_begin、 语句
-- ComCallProcedure	对应com_call_procedu 数
-- ComChangeMaster	对应com_change_mas 数
-- ComCommit	对应com_commit、 语
-- ComDelete	对应com_delete、 语句
-- ComDeleteMulti	对应com_delete_multi
-- ComInsert	对应com_insert、 语句
-- ComInsertSelect	对应com_insert_select
-- ComSelect	对应com_select、 语句
-- ComUpdate	对应com_update、 语
-- ComUpdateMulti	对应com_update_mult
-- Connections	对应connections、尝试
-- CreatedTmpDiskTable	对应created_tmp_disk 时表的次数
-- CreatedTmpFiles	对应created_tmp_files 次数
-- CreatedTmpTables	对应created_tmp_tabl 数
-- InnodbBufferPoolDumpStatus	对应innodb_buffer_pc innodb_xx_dump的进

-- InnodbBufferPoolLoadStatus	对应innodb_buffer_pc innodb_xx_load的进度
-- InnodbBufferPoolResizeStatus	对应innodb_buffer_pc 进度
-- InnodbBufferPoolBytesData	对应innodb_buffer_pc buffer_pool中的数据量
-- InnodbBufferPoolPagesData	对应innodb_buffer_pc buffer_pool中数据页面
-- InnodbBufferPoolPagesDirty	对应innodb_buffer_pc buffer_pool中脏页数量
-- InnodbBufferPoolBytesDirty	对应innodb_buffer_pc buffer_pool中脏数据量
-- InnodbBufferPoolPagesFlushed	对应innodb_buffer_pc 请求刷新出buffer_pool
-- InnodbBufferPoolPagesFree	对应innodb_buffer_pc buffer_pool中空闲页面
-- InnodbBufferPoolPagesMisc	对应innodb_buffer_pc buffer_pool total_pag
-- InnodbBufferPoolPagesTotal	对应innodb_buffer_pc buffer_pool 总项目数
-- InnodbBufferPoolReadAhead	对应innodb_buffer_pc read-ahead机制读入的
-- InnodbBufferPoolReadAheadEvicted	对应 innodb_buffer_pool_r 由raed-ahead机制读入 入后没有被访问而淘汰的
	对应innodb_buffer_pc

-- InnodbBufferPoolReadRequests	逻辑读的次数(读buffer_
-- InnodbBufferPoolReads	对应innodb_buffer_pc 次数(读磁盘)
-- InnodbBufferPoolWaitFree	对应innodb_buffer_pc 有可用页面的次数
-- InnodbBufferPoolWriteRequests	对应innodb_buffer_pc 请求写buffer_pool的次
-- InnodbDataFsyncs	对应innodb_data_fsyn 用的次数
-- InnodbDataPendingFsyncs	对应innodb_data_pen 起的fsyncs操作
-- InnodbDataPendingReads	对应innodb_data_pen 起的读操作
-- InnodbDataPendingWrites	对应innodb_data_pen 起的写操作
-- InnodbDataRead	对应innodb_data_reac 数据进buffer_pool
-- InnodbDataReads	对应innodb_data_reac 次数据进buffer_pool
-- InnodbDataWrites	对应innodb_data_writ 少次数据到buffer_pool
-- InnodbDataWritten	对应innodb_data_writ 少数据到buffer_pool
-- InnodbDblwrPagesWritten	对应innodb_dblwr_pa double_write写入到磁
	对应innodb_dblwr_wri

-- InnodbDblwrWrites	执行的次数
-- InnodbLogWaits	对应innodb_log_waits 数
-- InnodbLogWriteRequests	对应innodb_log_write_ 数
-- InnodbLogWrites	对应innodb_log_write:
-- InnodbOsLogFsyncs	对应innodb_os_log_fs 用的次数(针对redo log
-- InnodbOsLogPendingFsyncs	对应innodb_os_log_pe 的fsync操作数量
-- InnodbOsLogPendingWrites	对应innodb_os_log_pe 的write操作数量
-- InnodbOsLogWritten	对应innodb_os_log_wı 量
-- InnodbPagesCreated	对应innodb_pages_cre 量
-- InnodbPagesRead	对应innodb_pages_rea 读出的页面数量
-- InnodbPagesWritten	对应innodb_pages_wr buffer_pool写入的页面
-- InnodbRowLockCurrentWaits	对应innodb_row_lock_ 的行锁等待数量
-- InnodbRowLockTime	对应innodb_row_lock_ 锁上的总时间
-- InnodbRowLockTimeAvg	对应innodb_row_lock_ 取行锁上的平均时间

-- InnodbRowLockTimeMax	对应innodb_row_lock_ 获取行锁上的最大时间
-- InnodbRowLockWaits	对应innodb_row_lock_ 次数
-- InnodbRowsDeleted	对应innodb_rows_dele
-- InnodbRowsInserted	对应innodb_rows_inse
-- InnodbRowsRead	对应innodb_rows_reac
-- InnodbRowsUpdated	对应innodb_rows_upd
-- OpenTableDefinitions	对应open_table_defini 文件数量
-- OpenTables	对应open_tables 当前打
-- OpenedTableDefinitions	对应opened_table_def 的.frm文件数量
-- OpenedTables	对应opened_tables 曾
-- TableOpenCacheOverflows	对应table_open_cache 又关闭的次数
-- ThreadsCached	对应threads_cached 当 数量
-- ThreadsConnected	对应threads_connecte
-- ThreadsCreated	对应threads_created 为 的线程总数
-- ThreadsRunning	对应threads_running 非 程数
-- Uptime	对应uptime 从启动开始 多少秒

-- MgrTotalMemberCount	mgr集群中成员的数量
-- MgrOnLineMemberCount	mgr集群中online状态
-- MgrMemberState	当前mgr成员的状态
-- MgrCountTransactionsInQueue	当前mgr成员上等待进 量
-- MgrCountTransactionsChecked	当前mgr成员上已经完 量
-- MgrCountConflictsDetected	当前mgr成员上没能通 量
-- MgrTransactionsCommittedAllMembers	当前mgr成员上已经应

- 3 为了更好的与zabbix-agent结合、目前monitor.py能自动导出zabbix的配置文件；方法如下：

```
  python3 monitor.py export >
/tmp/zabbix_agent.conf
```

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