

# 尚硅谷大数据技术之 Zabbix

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## 第 1 章 Zabbix 入门

### 1.1 Zabbix 概述

Zabbix 是一款能够监控各种网络参数以及服务器健康性和完整性的软件。Zabbix 使用灵活的通知机制，允许用户为几乎任何事件配置基于邮件的告警。这样可以快速反馈服务器的问题。基于已存储的数据，Zabbix 提供了出色的报告和数据可视化功能。

## 第 2 章 Zabbix 安装之 server 节点

### 2.1 集群规划

节点	服务
hadoop102	zabbix-server、zabbix-agent、MySQL
hadoop103	zabbix-agent
hadoop104	zabbix-agent

### 2.2 准备工作

#### 2.2.1 关闭防火墙（已关闭）

```
sudo service iptables stop
sudo chkconfig iptables off
```

#### 2.2.2 关闭 SELinux

##### 1) 修改配置文件/etc/selinux/config

```
sudo vim /etc/selinux/config

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#     enforcing - SELinux security policy is enforced.
#     permissive - SELinux prints warnings instead of enforcing.
#     disabled - No SELinux policy is loaded.
SELINUX=disabled
# SELINXTYPE= can take one of these two values:
#     targeted - Targeted processes are protected,
#     mls - Multi Level Security protection.
SELINXTYPE=targeted
```

##### 2) 重启服务器

```
sudo reboot
```

## 2.3 Zabbix-server/agent 编译及安装

### 2.3.1 创建用户

```
sudo groupadd --system zabbix
sudo useradd --system -g zabbix -d /usr/lib/zabbix -s /sbin/nologin
-c "Zabbix Monitoring System" zabbix
```

### 2.3.2 上传 zabbix 安装包并解压

将安装包上传至 **/opt/software** 路径并解压到当前路径

```
tar -zxvf zabbix-4.2.8.tar.gz
```

### 2.3.3 创建 zabbix 数据库和表

1) 进入 **/opt/software/zabbix-4.2.8/database/mysql** 路径

```
cd /opt/software/zabbix-4.2.8/database/mysql
```

2) 进入 MySQL 客户端执行建表语句，并导入 zabbix 提供的 sql 脚本

```
mysql>
create database zabbix default character set utf8 collate utf8_bin;
use zabbix;
source schema.sql;
source data.sql;
source images.sql;
```

### 2.3.4 编译环境准备

1) 上传并安装 MySQL 相关 rpm 包

```
sudo rpm -ivh MySQL-devel-5.6.24-1.el6.x86_64.rpm
sudo rpm -ivh MySQL-embedded-5.6.24-1.el6.x86_64.rpm
sudo rpm -ivh MySQL-shared-5.6.24-1.el6.x86_64.rpm
sudo rpm -ivh MySQL-shared-compat-5.6.24-1.el6.x86_64.rpm
```

2) 安装所需依赖

```
sudo rpm -ivh http://www.city-fan.org/ftp/contrib/yum-repo/rhel6/x86_64/city-fan.org-release-2-1.rhel6.noarch.rpm

sudo yum-config-manager --enable city-fan.org

sudo rpm -ivh http://dl.fedoraproject.org/pub/epel/6/x86_64/Packages/l/libnghttp2-1.6.0-1.el6.1.x86_64.rpm

sudo rpm -e --nodeps libxml2-python-2.7.6-21.el6.x86_64

sudo yum install -y libcurl libcurl-devel libxml2 libxml2-devel net-snmp-devel libevent-devel pcre-devel gcc-c++
```

### 2.3.5 编译及安装

1) 进入 **/opt/software/zabbix-4.2.8** 路径

```
cd /opt/software/zabbix-4.2.8
```

## 2) 编译安装

```
./configure --enable-server --enable-agent --with-mysql  
--enable-ipv6 --with-net-snmp --with-libcurl --with-libxml2  
  
sudo make install
```

## 2.3.6 修改配置文件

### 1) 修改 zabbix-server 配置文件

```
sudo vim /usr/local/etc/zabbix_server.conf  
  
DBHost=hadoop102  
DBName=zabbix  
DBUser=root  
DBPassword=123456
```

### 2) 修改 zabbix-agent 配置文件

```
sudo vim /usr/local/etc/zabbix_agentd.conf  
  
Server=hadoop102  
#ServerActive=127.0.0.1  
#Hostname=Zabbix server
```

## 2.3.7 编写系统服务脚本

### 1) 编辑 zabbix-server 文件

```
sudo vim /etc/init.d/zabbix-server
```

### 2) 内容如下

```
#!/bin/sh  
#  
# chkconfig: - 85 15  
# description: Zabbix server daemon  
# config: /usr/local/etc/zabbix_server.conf  
#  
  
### BEGIN INIT INFO  
# Provides: zabbix  
# Required-Start: $local_fs $network  
# Required-Stop: $local_fs $network  
# Default-Start:  
# Default-Stop: 0 1 2 3 4 5 6  
# Short-Description: Start and stop Zabbix server  
# Description: Zabbix server  
### END INIT INFO  
  
# Source function library.  
. /etc/rc.d/init.d/functions  
  
if [ -x /usr/local/sbin/zabbix_server ]; then  
    exec=/usr/local/sbin/zabbix_server  
else  
    exit 5  
fi
```

```
prog=zabbix_server
conf=/usr/local/etc/zabbix_server.conf
pidfile=/tmp/zabbix_server.pid
timeout=10

if [ -f /etc/sysconfig/zabbix-server ]; then
    . /etc/sysconfig/zabbix-server
fi

lockfile=/var/lock/subsys/zabbix-server

start()
{
    echo -n "Starting Zabbix server: "
    daemon $exec -c $conf
    rv=$?
    echo
    [ $rv -eq 0 ] && touch $lockfile
    return $rv
}

stop()
{
    echo -n "Shutting down Zabbix server: "
    killproc -p $pidfile -d $timeout $prog
    rv=$?
    echo
    [ $rv -eq 0 ] && rm -f $lockfile
    return $rv
}

restart()
{
    stop
    start
}

case "$1" in
    start|stop|restart)
        $1
        ;;
    force-reload)
        restart
        ;;
    status)
        status -p $pidfile $prog
        ;;
    try-restart|condrestart)
        if status $prog >/dev/null ; then
            restart
        fi
        ;;
    reload)
        action $"Service ${0##*/} does not support the reload action:"
        /bin/false
        exit 3
        ;;
    *)
```

```
    echo                                $"Usage:                $0
{start|stop|status|restart|try-restart|force-reload}"
    exit 2
    ;;
esac
```

### 3) 加执行权限

```
sudo chmod +x /etc/init.d/zabbix-server
```

### 4) 编辑 zabbix-agent 文件

```
sudo vim /etc/init.d/zabbix-agent
```

### 5) 内容如下

```
#!/bin/sh
#
# chkconfig: - 86 14
# description: Zabbix agent daemon
# processname: zabbix_agentd
# config: /usr/local/etc/zabbix_agentd.conf
#

### BEGIN INIT INFO
# Provides: zabbix-agent
# Required-Start: $local_fs $network
# Required-Stop: $local_fs $network
# Should-Start: zabbix zabbix-proxy
# Should-Stop: zabbix zabbix-proxy
# Default-Start:
# Default-Stop: 0 1 2 3 4 5 6
# Short-Description: Start and stop Zabbix agent
# Description: Zabbix agent
### END INIT INFO

# Source function library.
. /etc/rc.d/init.d/functions

if [ -x /usr/local/sbin/zabbix_agentd ]; then
    exec=/usr/local/sbin/zabbix_agentd
else
    exit 5
fi

prog=zabbix_agentd
conf=/usr/local/etc/zabbix_agentd.conf
pidfile=/tmp/zabbix_agentd.pid
timeout=10

if [ -f /etc/sysconfig/zabbix-agent ]; then
    . /etc/sysconfig/zabbix-agent
fi

lockfile=/var/lock/subsys/zabbix-agent

start()
{
    echo -n "Starting Zabbix agent: "
    daemon $exec -c $conf
    rv=$?
}
```

```
    echo
    [ $rv -eq 0 ] && touch $lockfile
    return $rv
}

stop()
{
    echo -n "Shutting down Zabbix agent: "
    killproc -p $pidfile -d $timeout $prog
    rv=$?
    echo
    [ $rv -eq 0 ] && rm -f $lockfile
    return $rv
}

restart()
{
    stop
    start
}

case "$1" in
    start|stop|restart)
        $1
        ;;
    force-reload)
        restart
        ;;
    status)
        status -p $pidfile $prog
        ;;
    try-restart|condrestart)
        if status $prog >/dev/null ; then
            restart
        fi
        ;;
    reload)
        action $"Service ${0##*/} does not support the reload action:"
        /bin/false
        exit 3
        ;;
    *)
        echo
        echo "$Usage:                                $0"
        {start|stop|status|restart|try-restart|force-reload}"
        exit 2
        ;;
esac
```

#### 6) 加执行权限

```
sudo chmod +x /etc/init.d/zabbix-agent
```

## 2.4 部署 Zabbix-web

### 2.4.1 部署 httpd

#### 1) 安装 httpd

```
sudo yum -y install httpd
```

## 2) 修改 httpd 配置文件

```
sudo vim /etc/httpd/conf/httpd.conf
```

将以下红色部分放至改配置文件的对应位置

```
317 <Directory "/var/www/html">
318
319 #
320 # Possible values for the Options directive are "None", "All",
321 # or any combination of:
322 #   Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
323 #
324 # Note that "MultiViews" must be named *explicitly* --- "Options All"
325 # doesn't give it to you.
326 #
327 # The Options directive is both complicated and important. Please see
328 # http://httpd.apache.org/docs/2.2/mod/core.html#options
329 # for more information.
330 #
331     Options Indexes FollowSymLinks
332
333 #
334 # AllowOverride controls what directives may be placed in .htaccess files.
335 # It can be "All", "None", or any combination of the keywords:
336 #   Options FileInfo AuthConfig Limit
337 #
338     AllowOverride None
339
340 #
341 # Controls who can get stuff from this server.
342 #
343     Order allow,deny
344     Allow from all
345     <IfModule mod_php5.c>
346         php_value max_execution_time 300
347         php_value memory_limit 128M
348         php_value post_max_size 16M
349         php_value upload_max_filesize 2M
350         php_value max_input_time 300
351         php_value max_input_vars 10000
352         php_value always_populate_raw_post_data -1
353         php_value date.timezone Asia/Shanghai
354     </IfModule>
355
356 </Directory>
```

## 3) 拷贝 zabbix-web 的 php 文件到 httpd 的指定目录

```
sudo mkdir /var/www/html/zabbix
sudo cp -a /opt/software/zabbix-4.2.8/frontends/php/*
/var/www/html/zabbix/
```

## 2.4.2 安装 php5.6

### 1) 安装 yum 源

```
wget
http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.
noarch.rpm
wget
```

```
http://rpms.famillecollet.com/enterprise/remi-release-6.rpm  
sudo rpm -ivh epel-release-6-8.noarch.rpm remi-release-6.rpm
```

### 2) 激活 yum 源

```
sudo yum-config-manager --enable remi-php56
```

### 3) 安装 php 及相关组件

```
sudo yum install -y php php-bcmath php-mbstring php-xmlwriter  
php-xmlreader php-mcrypt php-cli php-gd php-curl php-mysql  
php-ldap php-zip php-fileinfo
```

## 2.5 Zabbix 启动

### 2.5.1 启动 Zabbix-Server

#### 1) 启动

```
sudo service zabbix-server start
```

#### 2) 开机自启

```
sudo chkconfig --add zabbix-server  
sudo chkconfig zabbix-server on
```

### 2.5.2 启动 Zabbix-Agent

#### 1) 启动

```
sudo service zabbix-agent start
```

#### 2) 开机自启

```
sudo chkconfig --add zabbix-agent  
sudo chkconfig zabbix-agent on
```

### 2.5.3 启动 Zabbix-Web (httpd)

#### 1) 启动

```
sudo service httpd start
```

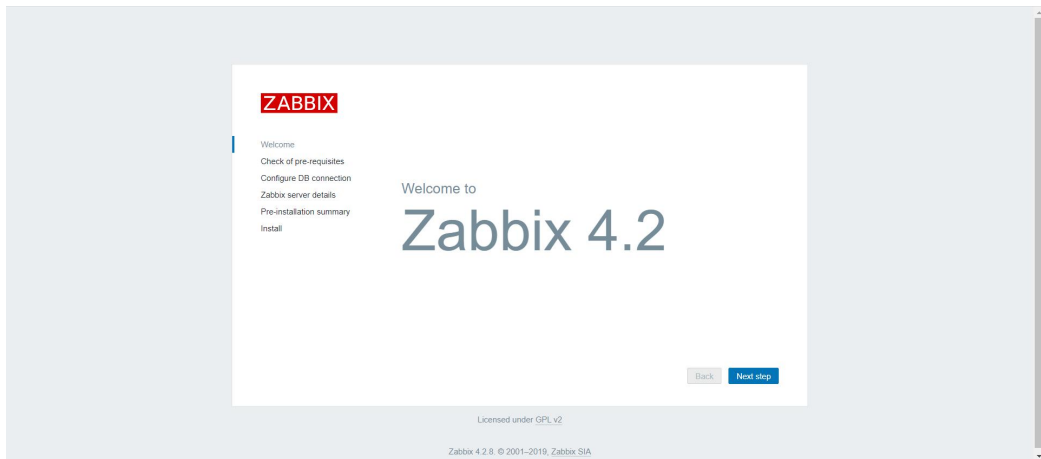
#### 2) 开机自启

```
sudo chkconfig httpd on
```

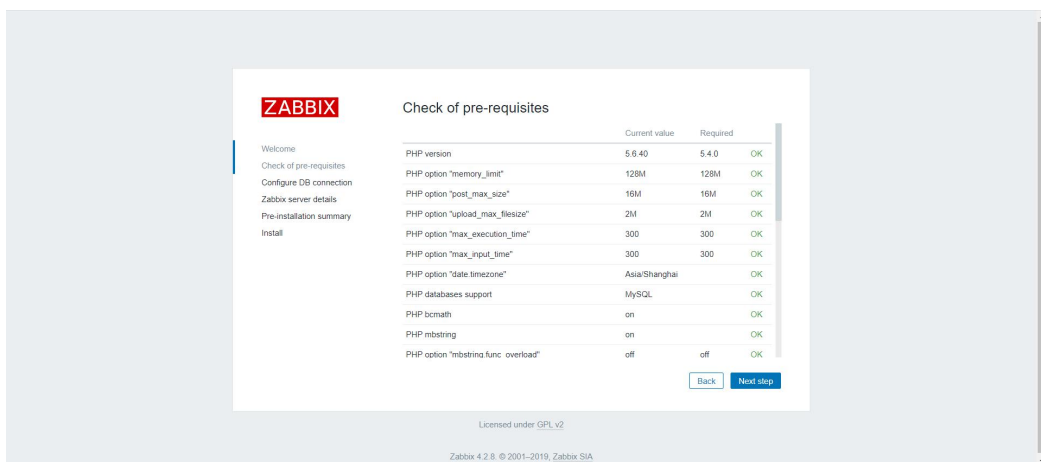
## 2.6 Zabbix 登录

### 1) 浏览器访问 <http://hadoop102/zabbix>

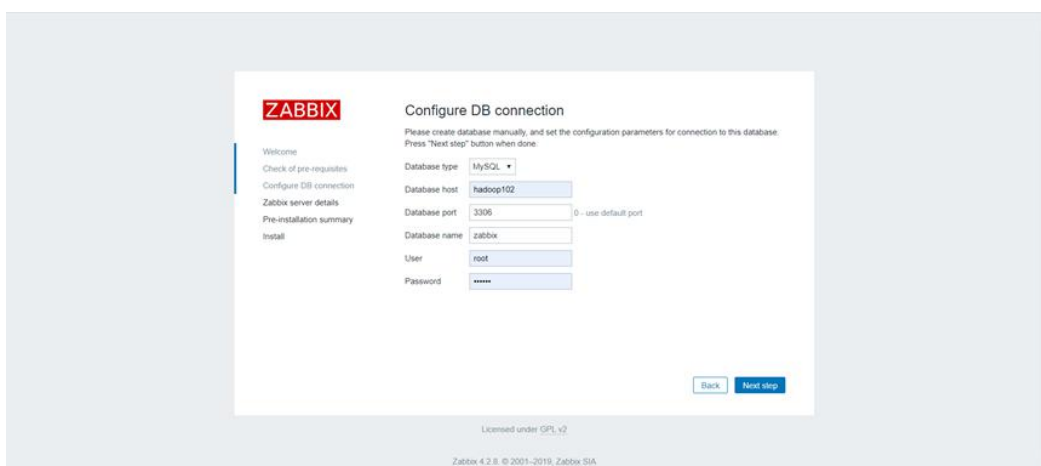




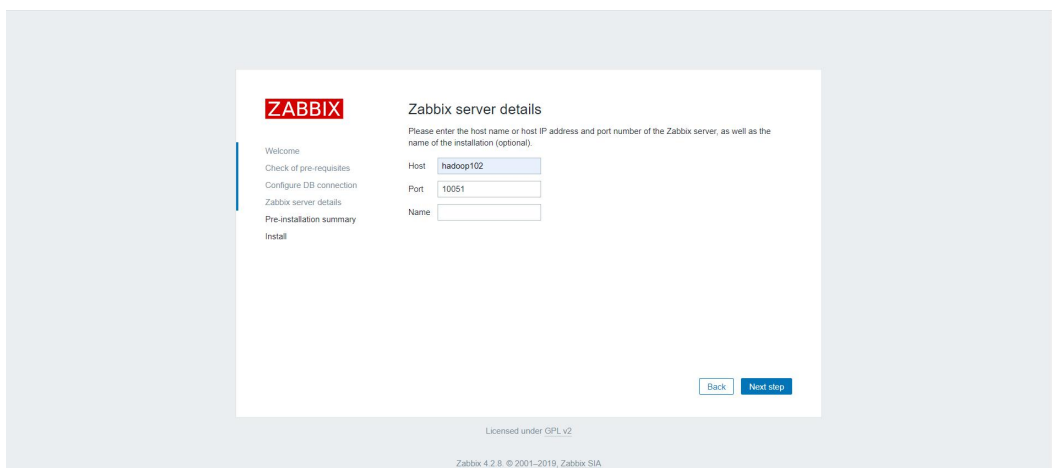
## 2) 检查配置



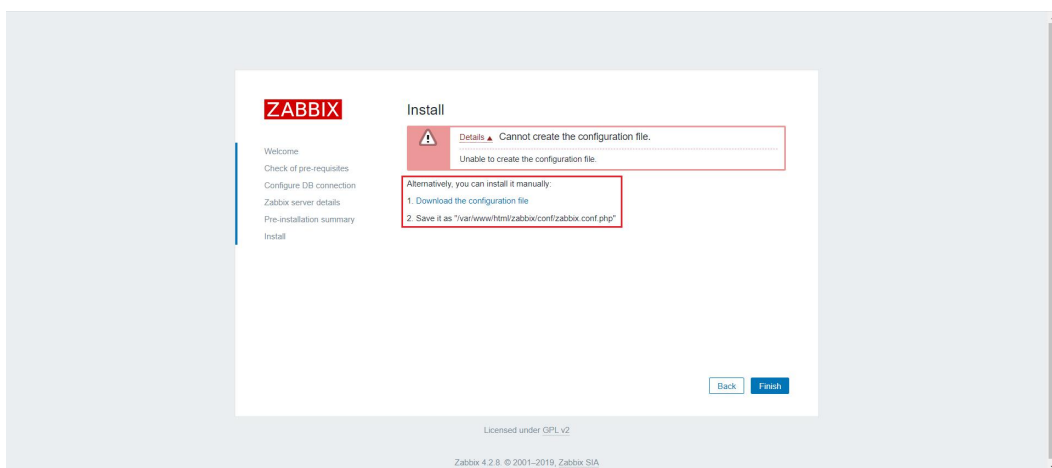
## 3) 配置数据库



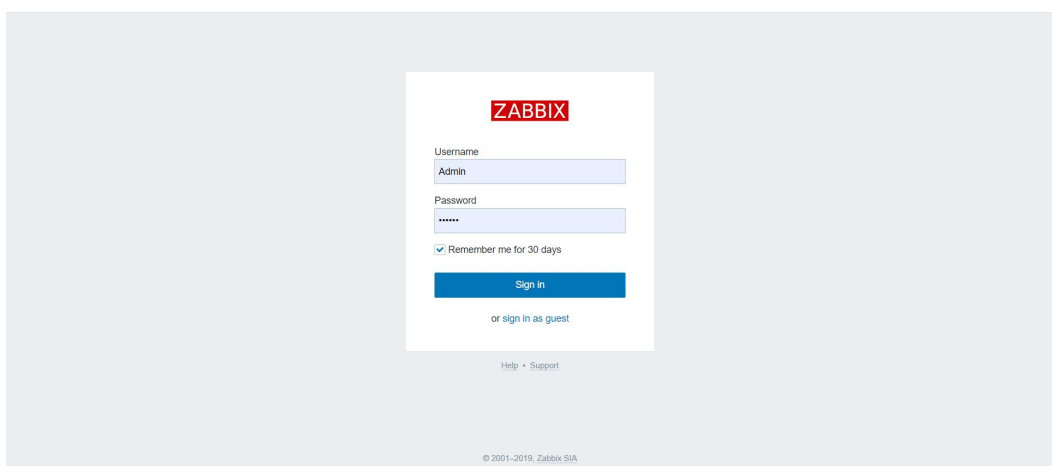
## 4) 配置 zabbix-server



5) 下载配置文件，并上传至指定路径



6) 登录，用户名：Admin，密码 zabbix



## 第 3 章 Zabbix 安装之 agent 节点

### 3.1 创建用户

```
sudo groupadd --system zabbix
```

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```
sudo useradd --system -g zabbix -d /usr/lib/zabbix -s /sbin/nologin  
-c "Zabbix Monitoring System" zabbix
```

## 3.2 编译环境准备

```
sudo yum -y install gcc-c++ pcre-devel
```

## 3.3 解压 Zabbix 安装包

将安装包上传至 **/opt/software** 路径并解压到当前路径

```
tar -zxvf zabbix-4.2.8.tar.gz
```

## 3.4 编译及安装

1) 进入 **/opt/software/zabbix-4.2.8** 路径，执行以下编译安装命令

```
./configure --enable-agent  
sudo make install
```

2) 修改 **zabbix-agent** 配置文件

```
sudo vim /usr/local/etc/zabbix_agentd.conf  
  
Server=hadoop102  
#ServerActive=127.0.0.1  
#Hostname=Zabbix server
```

## 3.5 编辑系统服务脚本

1) 编辑 **zabbix-agent** 文件

```
sudo vim /etc/init.d/zabbix-agent
```

2) 内容如下

```
#!/bin/sh  
#  
# chkconfig: - 86 14  
# description: Zabbix agent daemon  
# processname: zabbix_agentd  
# config: /usr/local/etc/zabbix_agentd.conf  
#  
  
### BEGIN INIT INFO  
# Provides: zabbix-agent  
# Required-Start: $local_fs $network  
# Required-Stop: $local_fs $network  
# Should-Start: zabbix zabbix-proxy  
# Should-Stop: zabbix zabbix-proxy  
# Default-Start:  
# Default-Stop: 0 1 2 3 4 5 6  
# Short-Description: Start and stop Zabbix agent  
# Description: Zabbix agent  
### END INIT INFO  
  
# Source function library.  
. /etc/rc.d/init.d/functions  
  
if [ -x /usr/local/sbin/zabbix_agentd ]; then  
    exec=/usr/local/sbin/zabbix_agentd
```

```
else
    exit 5
fi

prog=zabbix_agentd
conf=/usr/local/etc/zabbix_agentd.conf
pidfile=/tmp/zabbix_agentd.pid
timeout=10

if [ -f /etc/sysconfig/zabbix-agent ]; then
    . /etc/sysconfig/zabbix-agent
fi

lockfile=/var/lock/subsys/zabbix-agent

start()
{
    echo -n "Starting Zabbix agent: "
    daemon $exec -c $conf
    rv=$?
    echo
    [ $rv -eq 0 ] && touch $lockfile
    return $rv
}

stop()
{
    echo -n "Shutting down Zabbix agent: "
    killproc -p $pidfile -d $timeout $prog
    rv=$?
    echo
    [ $rv -eq 0 ] && rm -f $lockfile
    return $rv
}

restart()
{
    stop
    start
}

case "$1" in
    start|stop|restart)
        $1
        ;;
    force-reload)
        restart
        ;;
    status)
        status -p $pidfile $prog
        ;;
    try-restart|condrestart)
        if status $prog >/dev/null ; then
            restart
        fi
        ;;
    reload)
        action $"Service ${0##*/} does not support the reload action:"
```

```
" /bin/false
    exit 3
;;
*)
    echo                    $"Usage:                                $0
{start|stop|status|restart|try-restart|force-reload}"
    exit 2
;;
esac
```

### 3) 加执行权限

```
sudo chmod +x /etc/init.d/zabbix-agent
```

## 3.6 启动 Zabbix-Agent

### 1) 启动

```
sudo service zabbix-agent start
```

### 2) 开机自启

```
sudo chkconfig --add zabbix-agent
sudo chkconfig zabbix-agent on
```

## 第 4 章 Zabbix 使用

### 4.1 Zabbix 逻辑概念

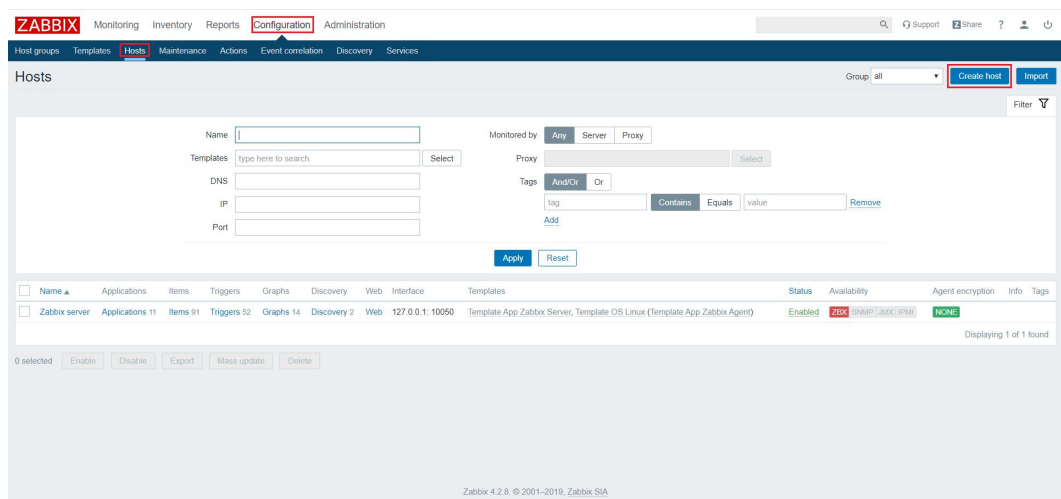
#### 3.1.1 Host

#### 3.2.1 Item

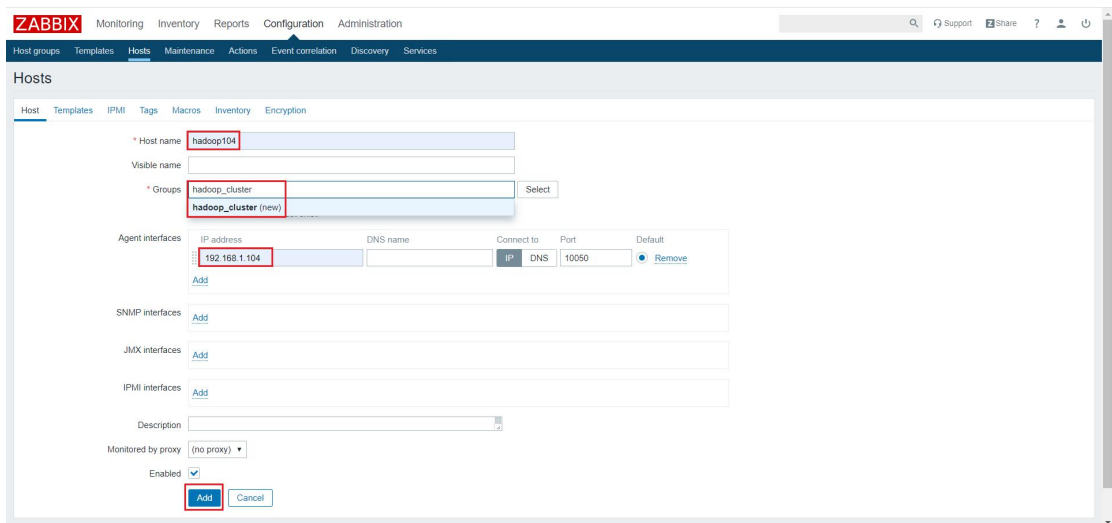
### 4.2 Zabbix 实战

#### 4.2.1 创建 Host

##### 1) 点击 Configuration/Hosts/Create host

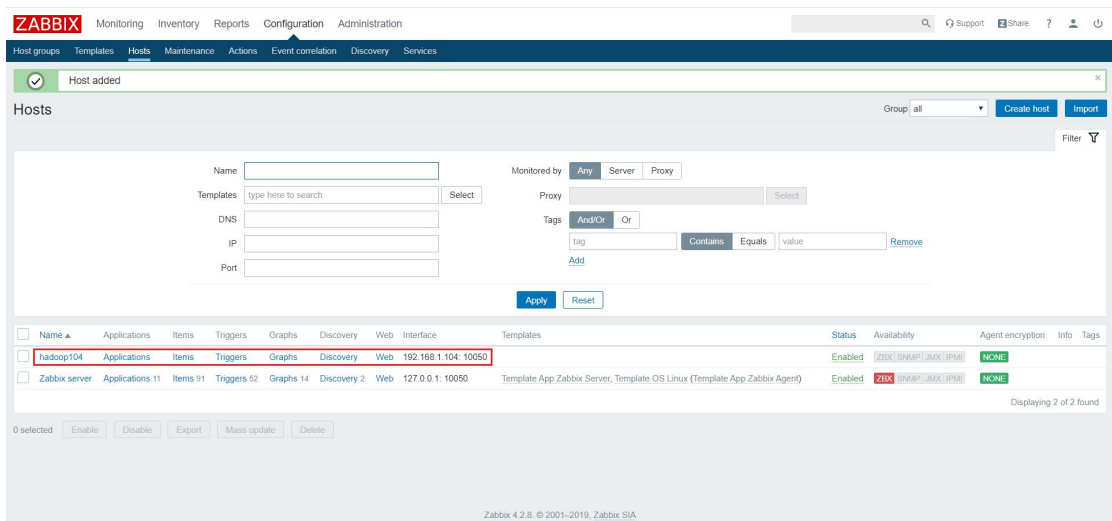


## 2) 配置 Host



The screenshot shows the Zabbix 'Hosts' configuration page. The 'Host name' field is set to 'hadoop104'. The 'Groups' dropdown is open, showing 'hadoop\_cluster' and 'hadoop\_cluster (new)'. The 'Agent interfaces' table has one entry with IP address '192.168.1.104', DNS name, and port '10050'. The 'Add' button at the bottom is highlighted with a red box.

## 3) 查看新增 Host

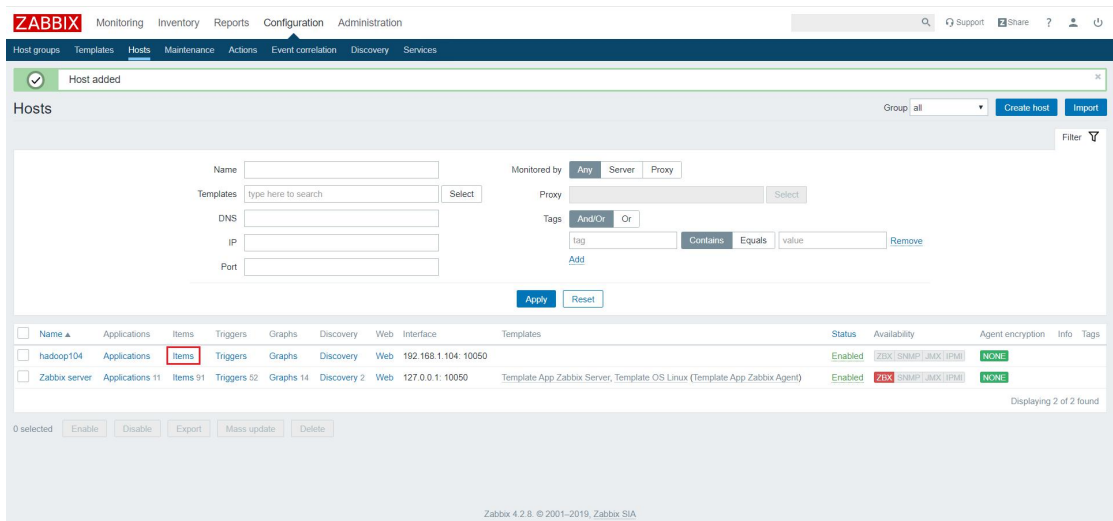


The screenshot shows the Zabbix 'Hosts' list page. A green banner at the top says 'Host added'. The table below lists the hosts. The first row, 'hadoop104', is highlighted with a red box. The 'Web' column for this host shows '192.168.1.104:10050'.

Name	Applications	Items	Triggers	Graphs	Discovery	Web	Interface	Templates	Status	Availability	Agent encryption	Info	Tags	
hadoop104						192.168.1.104:10050			Enabled	ZBX	SNMP	JMX	IPMI	NONE
Zabbix server						127.0.0.1:10050			Enabled	ZBX	SNMP	JMX	IPMI	NONE

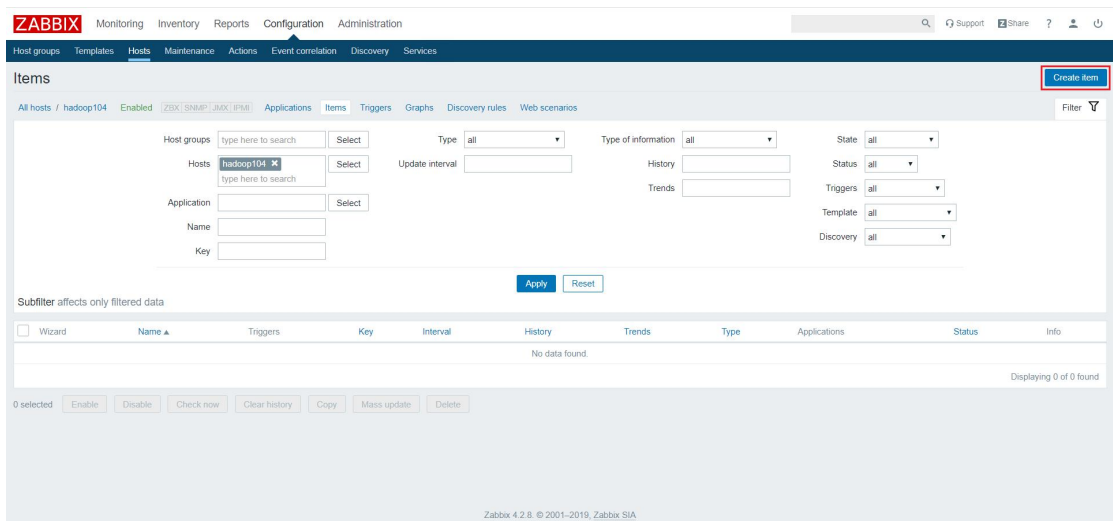
## 4.2.2 创建 Item

### 1) 点击 Items



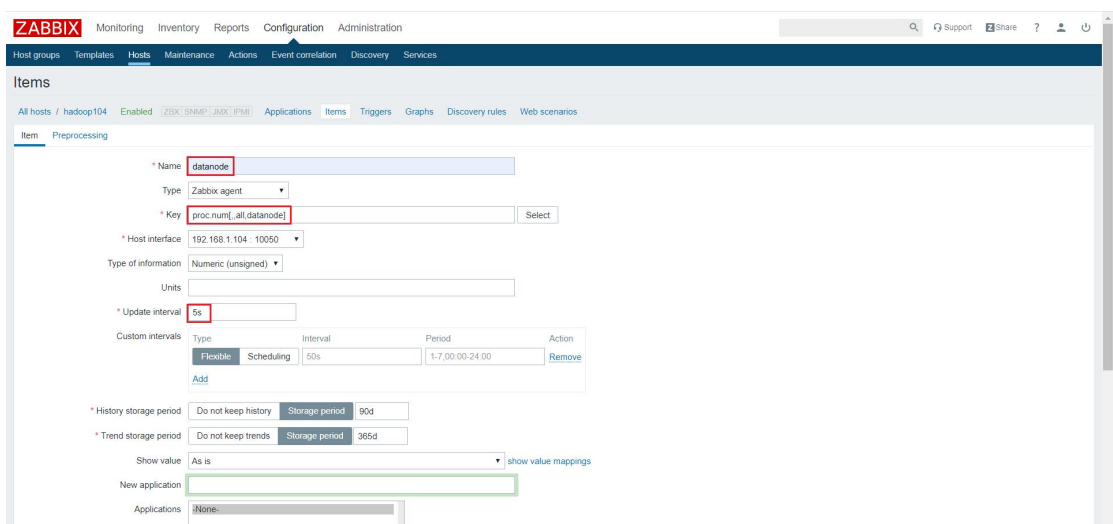
The screenshot shows the Zabbix 'Hosts' configuration page. At the top, there's a navigation bar with 'Monitoring', 'Inventory', 'Reports', 'Configuration', and 'Administration'. Below it, a sub-navigation bar includes 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Hosts' and features a 'Host added' confirmation message. Below this, there's a form to add a new host with fields for Name, Templates, DNS, IP, Port, Monitored by (Any, Server, Proxy), Proxy, Tags, and a 'Create host' button. A table below the form lists existing hosts with columns for Name, Applications, Items, Triggers, Graphs, Discovery, Web, Interface, Templates, Status, Availability, Agent encryption, Info, and Tags. The table shows two hosts: 'hadoop104' and 'Zabbix server'. At the bottom, there are buttons for '0 selected', 'Enable', 'Disable', 'Export', 'Mass update', and 'Delete'.

## 2) 点击 Create item



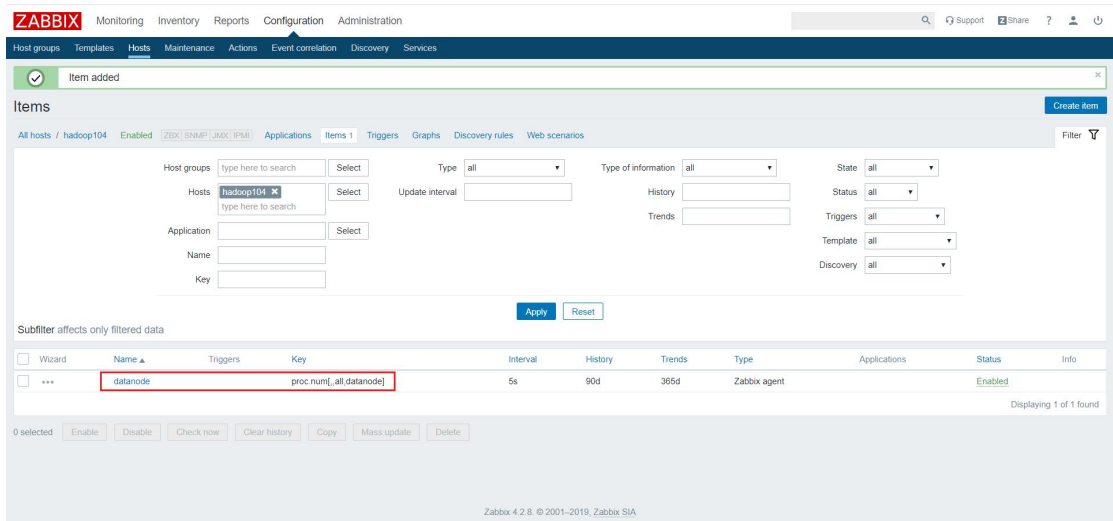
The screenshot shows the Zabbix 'Items' configuration page. The navigation bar is the same as the previous page. The sub-navigation bar includes 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Items' and features a 'Create item' button. Below this, there's a form to create a new item with fields for Host groups, Hosts, Application, Name, Key, Type, Update interval, Type of information, History, Trends, State, Status, Triggers, Template, and Discovery. A 'Subfilter affects only filtered data' section is also present. At the bottom, there are buttons for '0 selected', 'Enable', 'Disable', 'Check now', 'Clear history', 'Copy', 'Mass update', and 'Delete'.

## 3) 配置 Item



The screenshot shows the Zabbix 'Item configuration' page. The navigation bar is the same as the previous pages. The sub-navigation bar includes 'Host groups', 'Templates', 'Hosts', 'Maintenance', 'Actions', 'Event correlation', 'Discovery', and 'Services'. The main content area is titled 'Items' and features a 'Preprocessing' section. Below this, there's a form to configure a new item with fields for Name, Type, Key, Host interface, Type of information, Units, Update interval, Custom intervals, History storage period, Trend storage period, Show value, New application, and Applications. The 'Preprocessing' section includes a 'Name' field, a 'Type' dropdown, a 'Key' field, a 'Host interface' dropdown, a 'Type of information' dropdown, a 'Units' field, an 'Update interval' field, and a 'Custom intervals' section with a table for Type, Interval, Period, and Action. The 'History storage period' and 'Trend storage period' sections also have a table for Do not keep history, Storage period, and Action. At the bottom, there are buttons for '0 selected', 'Enable', 'Disable', 'Check now', 'Clear history', 'Copy', 'Mass update', and 'Delete'.

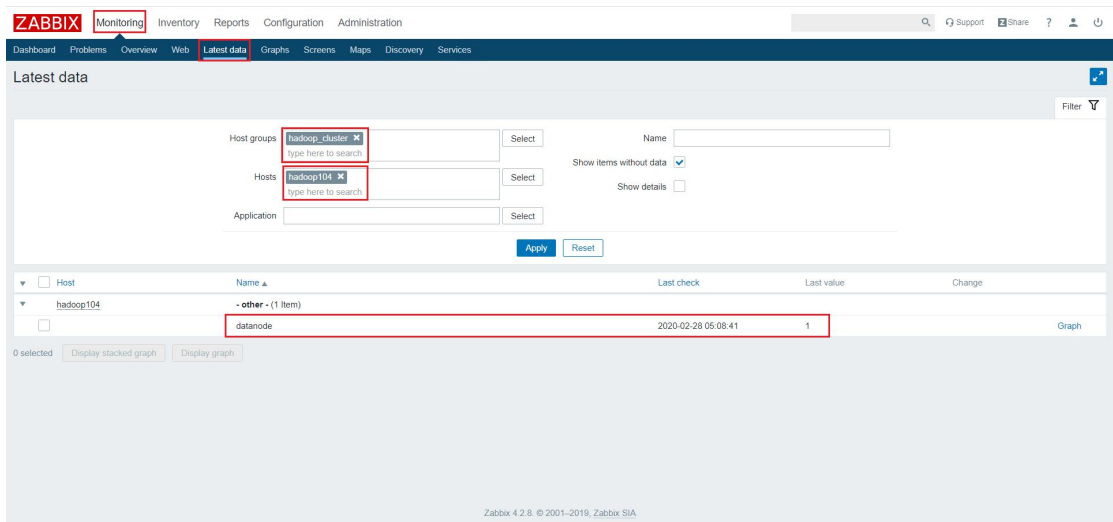
## 4) 查看创建的 Item



The screenshot shows the Zabbix 4.2.8 'Items' configuration page. The 'Hosts' dropdown is set to 'hadoop104'. The 'Application' dropdown is set to 'ZBX SNMP JMX IPMI'. The 'Type' dropdown is set to 'all'. The 'Status' dropdown is set to 'all'. The 'Name' field is empty. The 'Key' field is 'proc.num[all.datanode]'. The 'Update interval' is '5s'. The 'History' is '90d'. The 'Trends' is '365d'. The 'Type' is 'Zabbix agent'. The 'Status' is 'Enabled'. The table below shows one item: 'datanode' with key 'proc.num[all.datanode]' and status 'Enabled'.

Wizard	Name	Triggers	Key	Interval	History	Trends	Type	Applications	Status	Info
<input type="checkbox"/>	***		datanode	proc.num[all.datanode]	5s	90d	365d	Zabbix agent	Enabled	

## 5) 查看 Item 最新数据

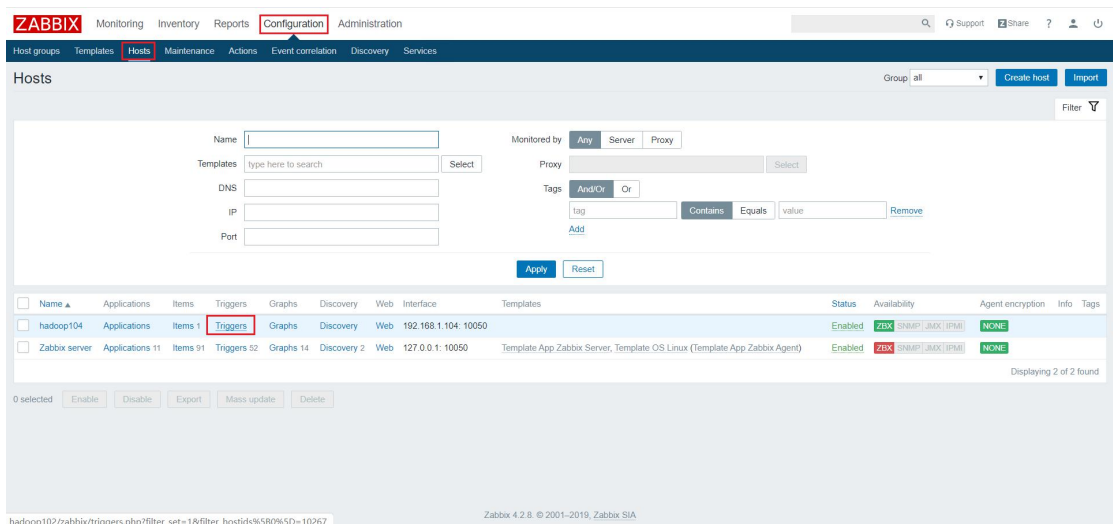


The screenshot shows the Zabbix 4.2.8 'Latest data' page. The 'Host groups' dropdown is set to 'hadoop\_cluster'. The 'Hosts' dropdown is set to 'hadoop104'. The 'Application' dropdown is set to 'ZBX SNMP JMX IPMI'. The 'Name' field is empty. The 'Show items without data' checkbox is checked. The table below shows one item: 'datanode' with last check '2020-02-28 05:08:41' and last value '1'.

Host	Name	Last check	Last value	Change
hadoop104	datanode	2020-02-28 05:08:41	1	

## 4.2.3 创建 Trigger

### 1) 点击 Conguration/Hosts/Triggers

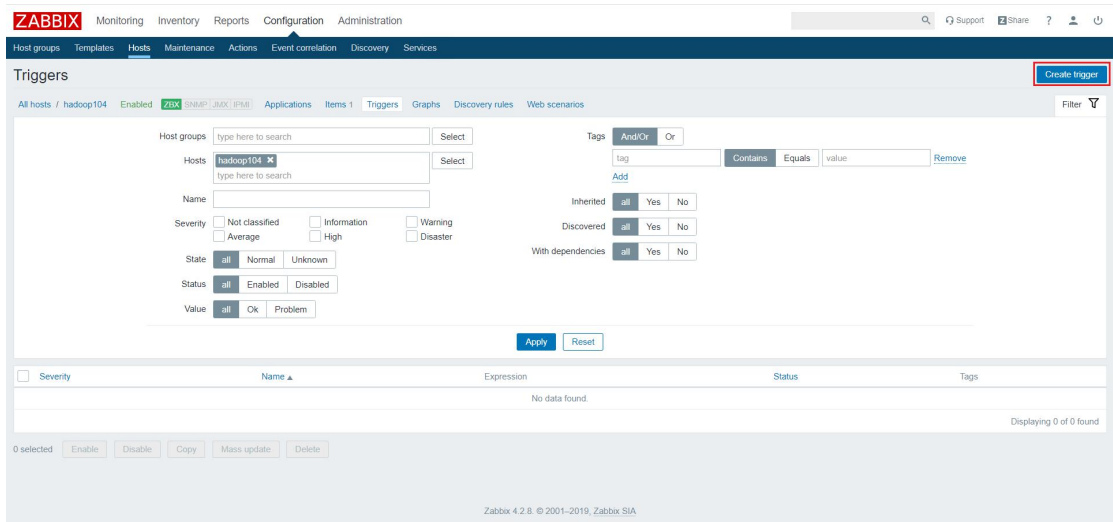


The screenshot shows the Zabbix 4.2.8 'Hosts' configuration page. The 'Name' field is empty. The 'Monitored by' dropdown is set to 'Any'. The 'Proxy' dropdown is set to 'Server'. The 'Tags' field is empty. The 'Status' dropdown is set to 'Enabled'. The table below shows two hosts: 'hadoop104' and 'Zabbix server'.

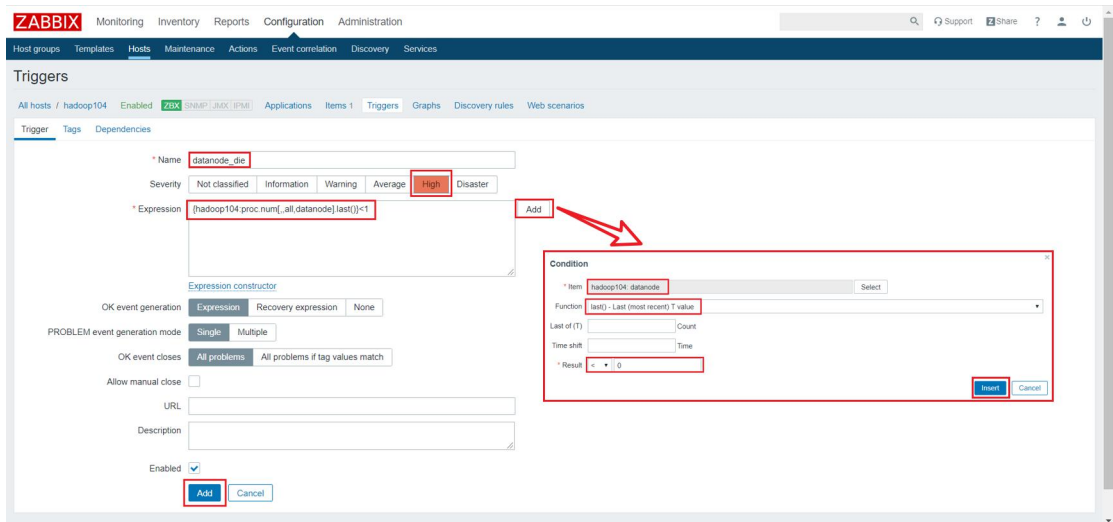
Name	Applications	Items	Triggers	Graphs	Discovery	Web	Interface	Templates	Status	Availability	Agent encryption	Info	Tags
hadoop104	Applications	Items 1	Triggers 1	Graphs	Discovery	Web	192.168.1.104: 10050	Template App Zabbix Agent	Enabled	100%	NONE		
Zabbix server	Applications 11	Items 91	Triggers 52	Graphs 14	Discovery 2	Web	127.0.0.1: 10050	Template App Zabbix Server, Template OS Linux (Template App Zabbix Agent)	Enabled	100%	NONE		



## 2) 点击 Create Trigger

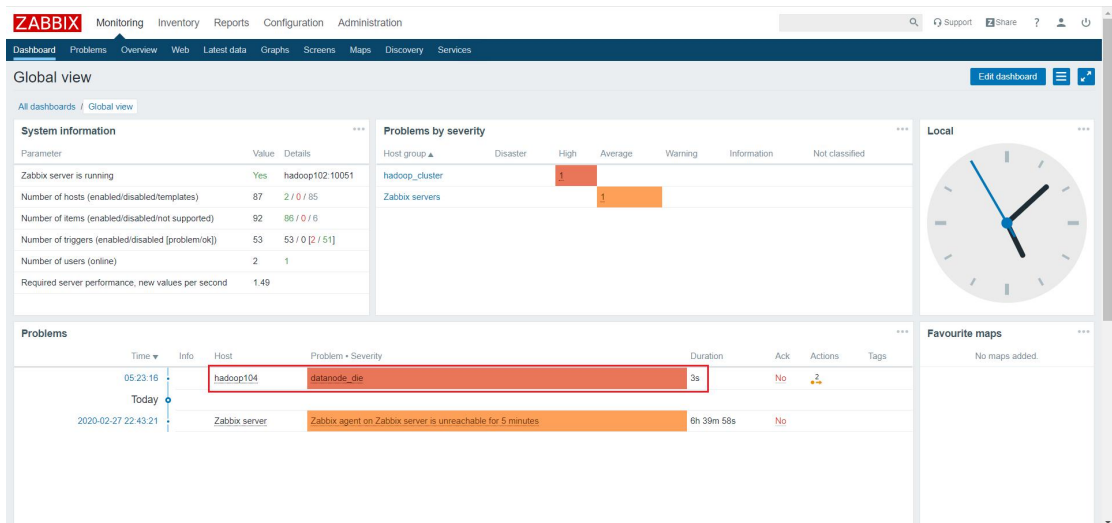


## 3) 编辑 Trigger



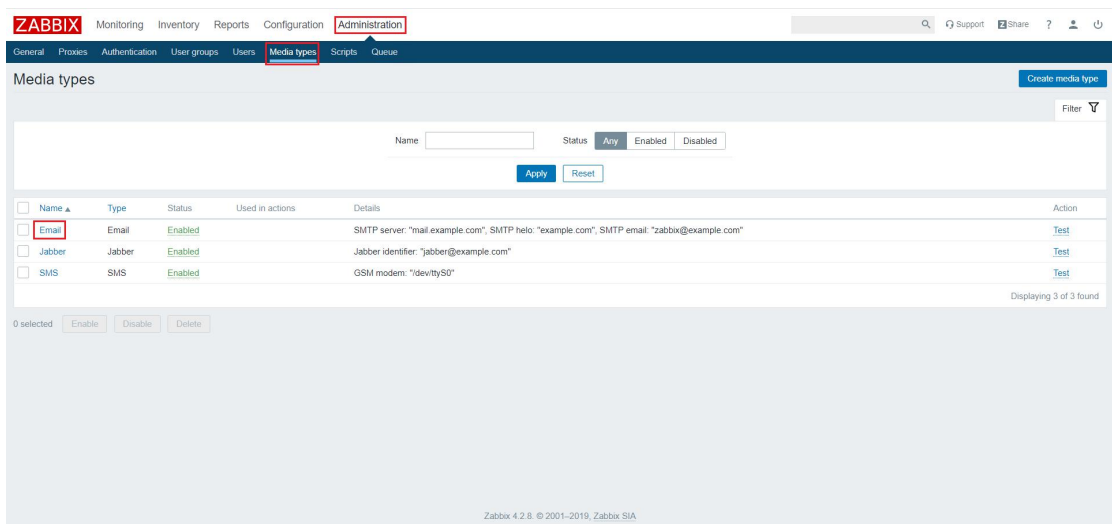
## 4) 测试 Trigger

关闭集群中的 HDFS，会有如下效果

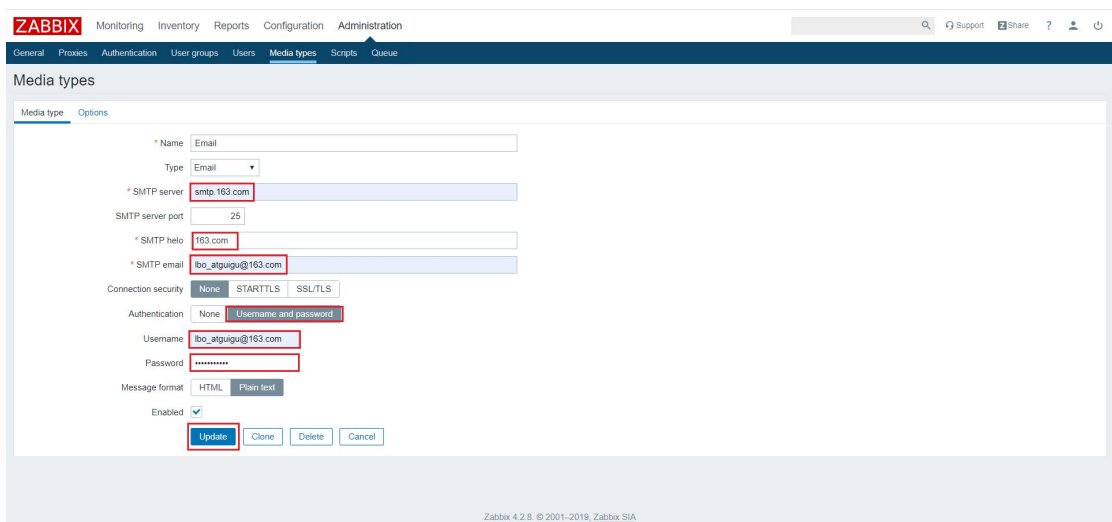


## 4.2.4 创建 Media type

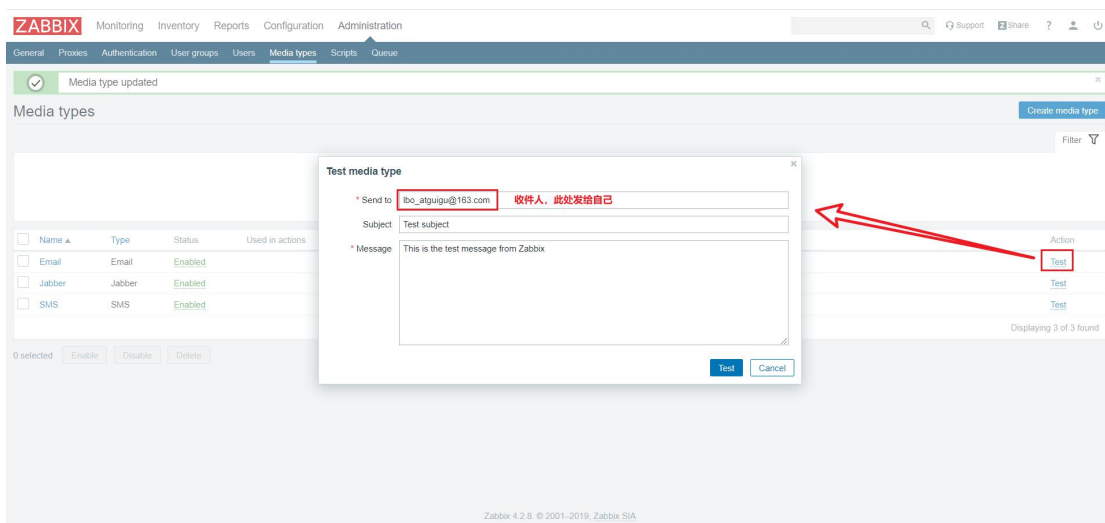
### 1) 点击 Administration/Media types/Email



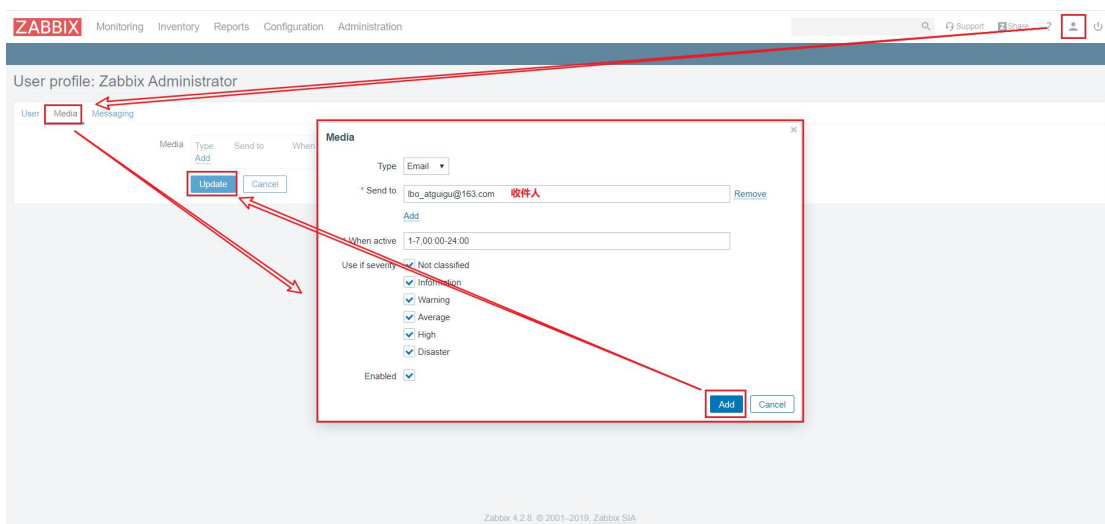
### 2) 编辑 Email



### 3) 测试 Email

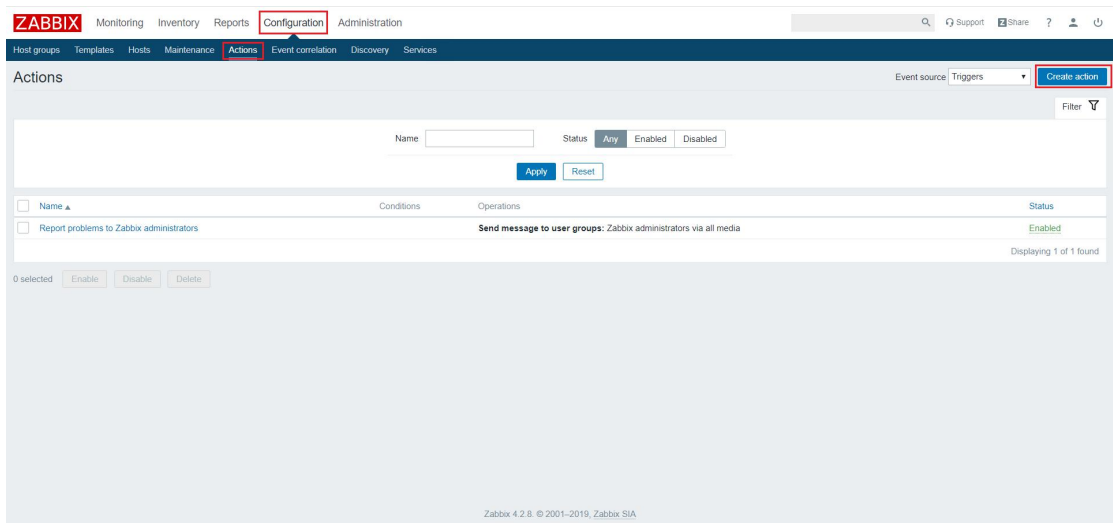


### 4) Email 绑定收件人



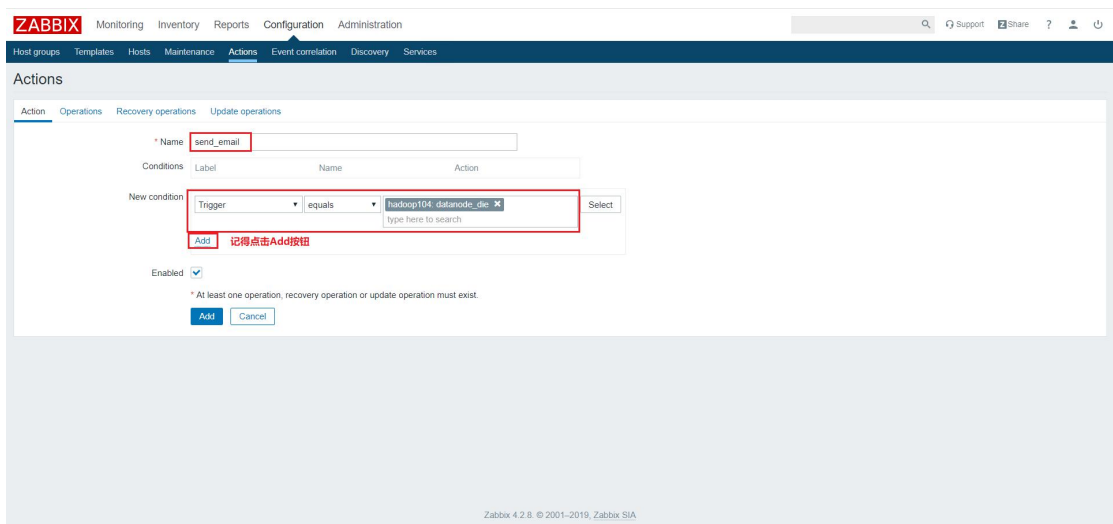
## 4.2.4 创建 Action

### 1) 点击 Configuration/Actions/Create action

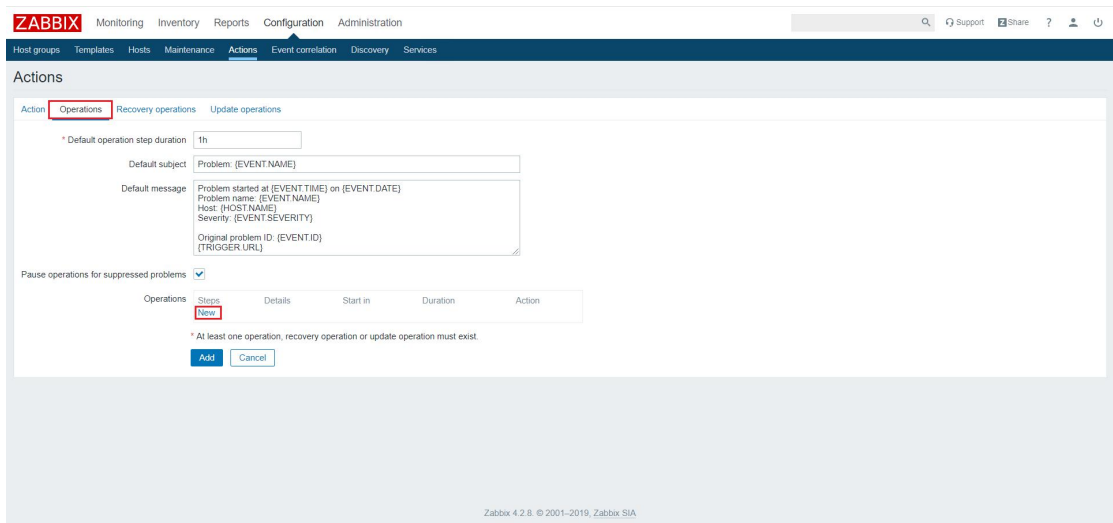


The screenshot shows the Zabbix Actions configuration page. The 'Configuration' tab is selected in the top navigation bar. The 'Actions' sub-tab is also selected. The 'Event source' is set to 'Triggers'. The 'Create action' button is highlighted with a red box. Below the form, there is a table with one row: 'Report problems to Zabbix administrators' with a status of 'Enabled'. The table has columns for Name, Conditions, Operations, and Status. The footer indicates 'Zabbix 4.2.8. © 2001-2019, Zabbix SIA'.

## 2) 编辑 Action



The screenshot shows the Zabbix Action configuration page. The 'Configuration' tab is selected in the top navigation bar. The 'Actions' sub-tab is selected. The 'Name' field is set to 'send\_email'. The 'Conditions' section shows a new condition: 'Trigger' equals 'hadoop104\_datainode\_dse'. The 'Add' button is highlighted with a red box and labeled '记得点击Add按钮'. The 'Enabled' checkbox is checked. The footer indicates 'Zabbix 4.2.8. © 2001-2019, Zabbix SIA'.



The screenshot shows the Zabbix Operations configuration page. The 'Configuration' tab is selected in the top navigation bar. The 'Operations' sub-tab is selected. The 'Default operation step duration' is set to '1h'. The 'Default subject' is 'Problem: [EVENTNAME]'. The 'Default message' is a multi-line text field containing: 'Problem started at [EVENT.TIME] on [EVENT.DATE]', 'Problem name: [EVENT.NAME]', 'Host: [HOST.NAME]', 'Severity: [EVENT.SEVERITY]', and 'Original problem ID: [EVENT.ID] ([TRIGGER.URL])'. The 'Pause operations for suppressed problems' checkbox is checked. The 'Operations' section shows a table with columns: Operations, Steps, Details, Start in, Duration, and Action. The 'New' button is highlighted with a red box. The footer indicates 'Zabbix 4.2.8. © 2001-2019, Zabbix SIA'.

Pause operations for suppressed problems ☒

Operations	Steps	Details	Start in	Duration	Action
<b>Operation details</b>					
Steps <input type="text" value="1"/> - <input type="text" value="1"/> (0 - infinitely)					
Step duration <input type="text" value="0"/> (0 - use action default)					
Operation type <input type="text" value="Send message"/>					
* At least one user or user group must be selected.					
<b>Send to User groups</b>					
<input type="text" value="User group"/> <input type="button" value="Add"/>					
<input type="text" value="Zabbix administrators"/> <input type="button" value="Remove"/>					
<b>Send to Users</b>					
<input type="text" value="User"/> <input type="button" value="Add"/>					
<input type="text" value="Admin (Zabbix Administrator)"/> <input type="button" value="Remove"/>					
Send only to <input type="text" value="Email"/>					
Default message <input checked="" type="checkbox"/>					
<b>Conditions</b>					
<input type="button" value="New"/>					
<input type="button" value="Add"/> <input type="button" value="Cancel"/>					
* At least one operation, recovery operation or update operation must exist.					
<input type="button" value="Add"/> <input type="button" value="Cancel"/>					

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**ZABBIX** Monitoring Inventory Reports Configuration Administration

Host groups Templates Hosts Maintenance **Actions** Event correlation Discovery Services

**Actions**

Action Operations Recovery operations Update operations

\* Default operation step duration

Default subject

Default message   
Problem name: {EVENT.NAME}  
Host: {HOST.NAME}  
Severity: {EVENT.SEVERITY}  
Original problem ID: {EVENT.ID} (TRIGGER.URL)"/>

Pause operations for suppressed problems ☒

Operations	Steps	Details	Start in	Duration	Action
<b>1</b>					
Send message to users: Admin (Zabbix Administrator) via Email. Immediately. Default. <input type="button" value="Edit"/> <input type="button" value="Remove"/>					
Send message to user groups: Zabbix administrators via Email					
<input type="button" value="New"/>					
* At least one operation, recovery operation or update operation must exist.					
<input type="button" value="Add"/> <input type="button" value="Cancel"/>					

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### 3) 测试

重新启动 HDFS，再关闭 HDFS 时，即可收到邮件通知