



Zabbix

Open-source Monitoring Tool

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1. Zabbix Introduction

1.1 What is Zabbix?

Zabbix is an enterprise-class open source distributed monitoring solution. Zabbix is software that monitors numerous parameters of a network and the health and integrity of servers.

Zabbix is free of cost. Zabbix ,distributed under the GPL General Public License version 2.

1.2 History

Zabbix started as an internal software project in 1998. After three years, in 2001, it was released to the public under GPL and currently is actively developed and supported by Zabbix SIA.

- Initial release : April 2001; 18 years ago
- Written in : C (server, proxy, agent), PHP (frontend), Java (Java gateway)
- Operating System : Cross-platform
- License : under GPLv2

1.3 Main Components

If you start to use Zabbix , you will definitely need to know about Zabbix's main components :

1.Server

Zabbix server is the central process of Zabbix software. The server performs the polling and trapping of data, it calculates triggers, sends notifications to users. It is the central component to which Zabbix agents and proxies report data on availability and integrity of systems.

2.Agent

Zabbix agent is deployed on a monitoring target to actively monitor local resources and applications (hard drives, memory, processor statistics etc).

The agent gathers operational information locally and reports data to Zabbix server for further processing. In case of failures (such as a hard disk running full or a crashed service process), Zabbix server can actively alert the administrators of the particular machine that reported the failure.

.Zabbix agents can perform passive and active checks.

3.Proxy

Zabbix proxy is a process that may collect monitoring data from one or more monitored devices and send the information to the Zabbix server, essentially working on behalf of the server.

4.Java Gateway

Native support for monitoring JMX applications exists in the form of a Zabbix daemon called “Zabbix Java gateway”, available since Zabbix 2.0. Zabbix Java gateway is a daemon written in Java.

5.Sender

Zabbix sender is a command line utility that may be used to send performance data to Zabbix server for processing. The utility is usually used in long running user scripts for periodical sending of availability and performance data.

6.Get

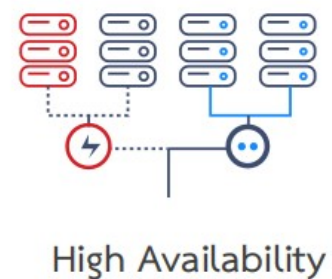
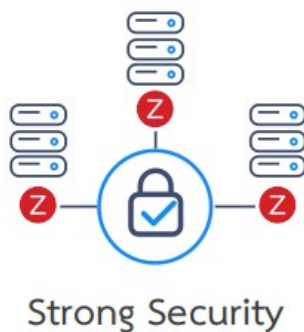
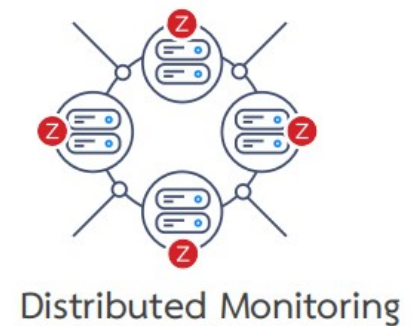
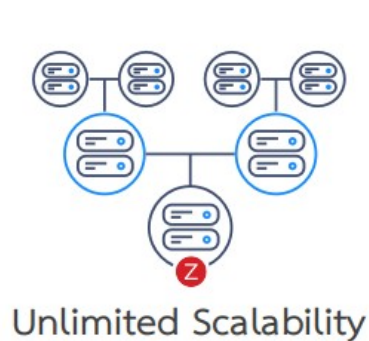
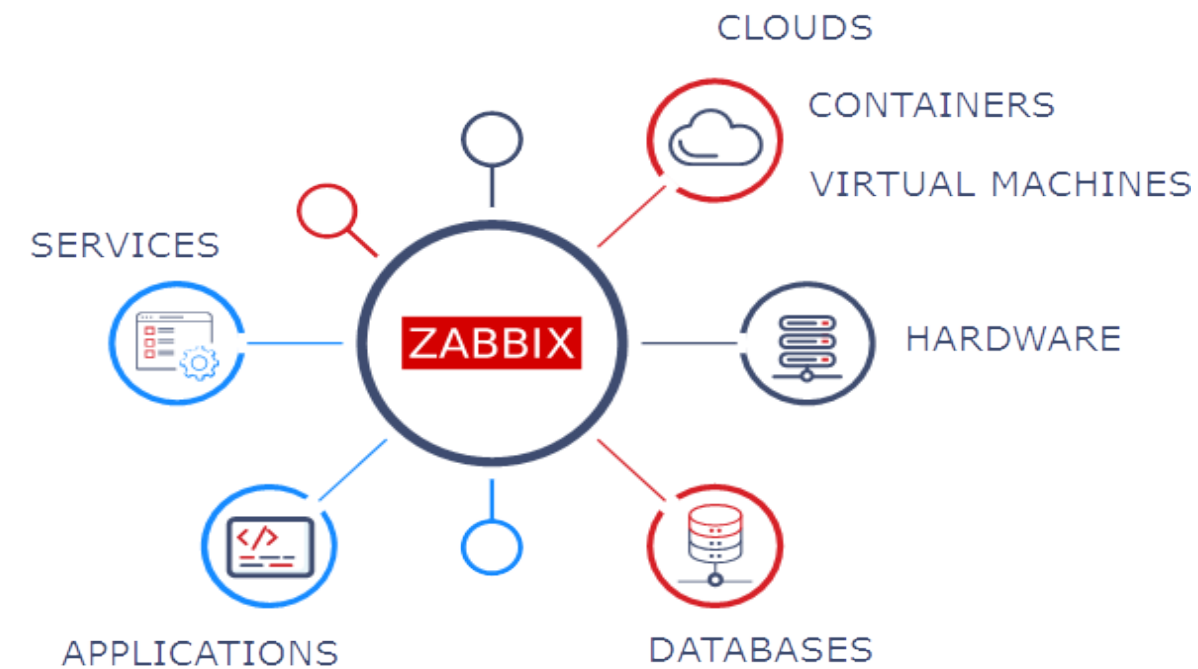
Zabbix get is a command line utility which can be used to communicate with Zabbix agent and retrieve required information from the agent. The utility is usually used for the troubleshooting of Zabbix agents.

7.JS

Zabbix_js is a command line utility that can be used for embedded script testing. This utility will execute a user script with a string parameter and print the result. Scripts are executed using the embedded Zabbix scripting engine.

1.4 Monitoring

Zabbix can monitor anything. It is the solution for any kind of IT infrastructure, services, applications, cloud resources. Zabbix is the ultimate enterprise-level software designed for real-time monitoring of millions of metrics collected from tens of thousands of servers, virtual machines and network devices. Zabbix can monitor Fault and performance only except Configuration, accounting, and Security. It also provides monitoring metrics, such as network utilization, CPU load and disk space consumption. It can be deployed for agent-based and agentless monitoring. Zabbix can monitor both Linux and Windows environments.



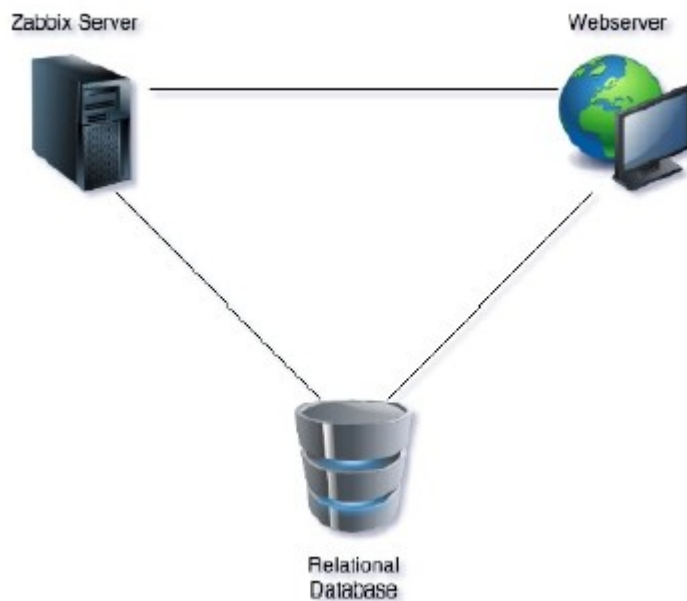
Zabbix's support for Enterprise Monitoring

1.5 Zabbix Features and Architecture

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Features that Zabbix provides :

- ◆ A centralized, easy to use web interface
- ◆ A server that runs on most UNIX-like operating systems, including Linux,
- ◆ AIX, FreeBSD, OpenBSD, and Solaris
- ◆ Native agents for most UNIX-like operating systems and Microsoft Windows versions
- ◆ The ability to directly monitor SNMP (SNMPv1, SNMPv2c, and SNMPv3) and IPMI devices
- ◆ The ability to directly monitor Java applications using JMX
- ◆ The ability to directly monitor vCenter or vSphere instances using the VMware API
- ◆ Built-in graphing and other visualization capabilities
- ◆ Notifications that allow easy integration with other systems
- ◆ Flexible configuration, including templating
- ◆ Low-Level Discovery (LLD) and the ability to generate items, graphs, and triggers (among others) in an automated way
- ◆ A lot of other features that allow you to implement a sophisticated monitoring solution



Zabbix's Architecture

2. Zabbix Installation

2.1. Configuring step-by-step

Prerequisites

- ❖ Apache web server
- ❖ PHP with required extensions
- ❖ MySQL/ MariaDB server
- ❖ Installing Zabbix on CentOS

Step 1 – Disable SELinux

Open SELinux configuration and edit the file:

```
- vim /etc/sysconfig/selinux
```

Change “SELINUX=enforcing” to “SELINUX=disabled”

Save and exit the file. Then reboot the system.

```
: reboot
```

Step 2 – Install and Configure Apache

Use the following commands:

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

Check service status.

```
- systemctl status httpd.service
```

If Apache service is not running, start it manually

```
systemctl start httpd.service
```

Enable httpd service on system boot.

```
- systemctl enable httpd
```

Step 3 – Configure Needed Repositories

Install epel and remi repos.

```
- yum -y install epel-release
```

```
- yum install http://rpms.remirepo.net/enterprise/remi-release-7.rpm
```

Disable PHP 5 repositories and enable PHP 7.2 repo.

```
- yum-config-manager --disable remi-php54
```

```
- yum-config-manager --enable remi-php72
```

Step 4 – Install PHP

```
- yum install php php-pear php-cgi php-common php-mbstring php-  
snmp php-gd php-pecl-mysql php-xml php-mysql php-gettext php-  
bcmath
```

Modify the PHP time Zone by editing the php.ini file.

```
- vim /etc/php.ini
```

Uncomment the following line and add your time zone.

```
date.timezone = Asia/Yangon
```

Step 5 – Install MariaDB

```
yum install mariadb-server
```

Start the MariaDB service.

```
systemctl start mariadb.service
```

Enable MariaDB on system boot.

```
systemctl enable mariadb
```

Run the following command to secure MariaDB.

```
mysql_secure_installation
```

Add a new root password and continue. Then it will ask a few questions. Type “Y” to agree to that.

```
[root@localhost yum.repos.d]# mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MariaDB
root user without the proper authorisation.

Set root password? [Y/n] Y
New password:
Re-enter new password:
Password updated successfully!
Reloading privilege tables..
... Success!

By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
them. This is intended only for testing, and to make the installation
go a bit smoother. You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y
... Success!

Normally, root should only be allowed to connect from 'localhost'. This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] Y
... Success!

By default, MariaDB comes with a database named 'test' that anyone can
access. This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] Y
- Dropping test database...
... Success!
- Removing privileges on test database...
... Success!

Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] Y
... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.
```

MariaDB Secure Installation

Login to DB server and verify.

```
mysql -u root -p
```

Step 6 – Create a Database for Zabbix

You can choose any name for the database in place of *zabbix* in the below command:

```
Create database zabbix;
```

Create a DB user and grant privileges.

```
create user 'zabbixuser'@'localhost' identified BY 'g4zabbix';  
grant all privileges on zabbix.* to zabbixuser@localhost ;
```

Flush privileges.

```
flush privileges;
```

Step 7 – Install Zabbix and needed dependencies

Adding Zabbix repository. Copy the latest download URL from the official [website](#). Paste it in the below command appropriately.


```
rpm -ivh https://repo.zabbix.com/zabbix/4.0/rhel/7/x86_64/zabbix-release-4.0-1.el7.noarch.rpm
```

Install Zabbix.

```
yum install zabbix-server-mysql zabbix-web-mysql zabbix-agent zabbix-get
```

Step 8 – Configure Zabbix

Change Time Zone by editing the Zabbix Apache configuration file.

```
vim /etc/httpd/conf.d/zabbix.conf
```

Uncomment the following line and add your Time Zone.

```
php_value date.timezone Asia/Yangon
```

PHP Parameters should look like as follows:

```
php_value max_execution_time 300
```

```
php_value memory_limit 128M
```

```
php_value post_max_size 16M
```

```
php_value upload_max_filesize 2M

php_value max_input_time 300

php_value max_input_vars 10000

php_value always_populate_raw_post_data -1

php_value date.timezone Asia/Yangon
```

Restart HTTPD service.

```
systemctl restart httpd.service
```

Generally, Zabbix installation package gives SQL file which includes an initial schema and data for the Zabbix server with MySQL.

Change directory and go the Zabbix directory.

```
cd /usr/share/doc/zabbix-server-mysql-4.0.4/
```

Import the MySQL dump file.

```
zcat create.sql.gz | mysql -u zabbixuser -p Zabbix
```

```
[root@localhost zabbix-server-mysql-4.0.4]# zcat create.sql.gz | mysql -u zabbixuser -p fosslinuxzabbix
Enter password:
[root@localhost zabbix-server-mysql-4.0.4]#
```

Import SQL Dump

Now modify the Zabbix configuration file with Database details.

```
vim /etc/zabbix/zabbix_server.conf
```

Modify the following parameters

```
DBHost=localhost
```

```
DBName=zabbix
```

```
DBUser=zabbixuser
```

```
DBPassword=g4zabbix
```

Then save and exit the file. Restart Zabbix service.

```
systemctl status zabbix-server.service
```

Enable Zabbix on system boot.

```
systemctl enable zabbix-server.service
```

Modify firewall rules.

```
firewall-cmd --add-service={http,https} --permanent
```

```
firewall-cmd --add-port={10051/tcp,10050/tcp} --permanent
```

```
firewall-cmd --reload
```

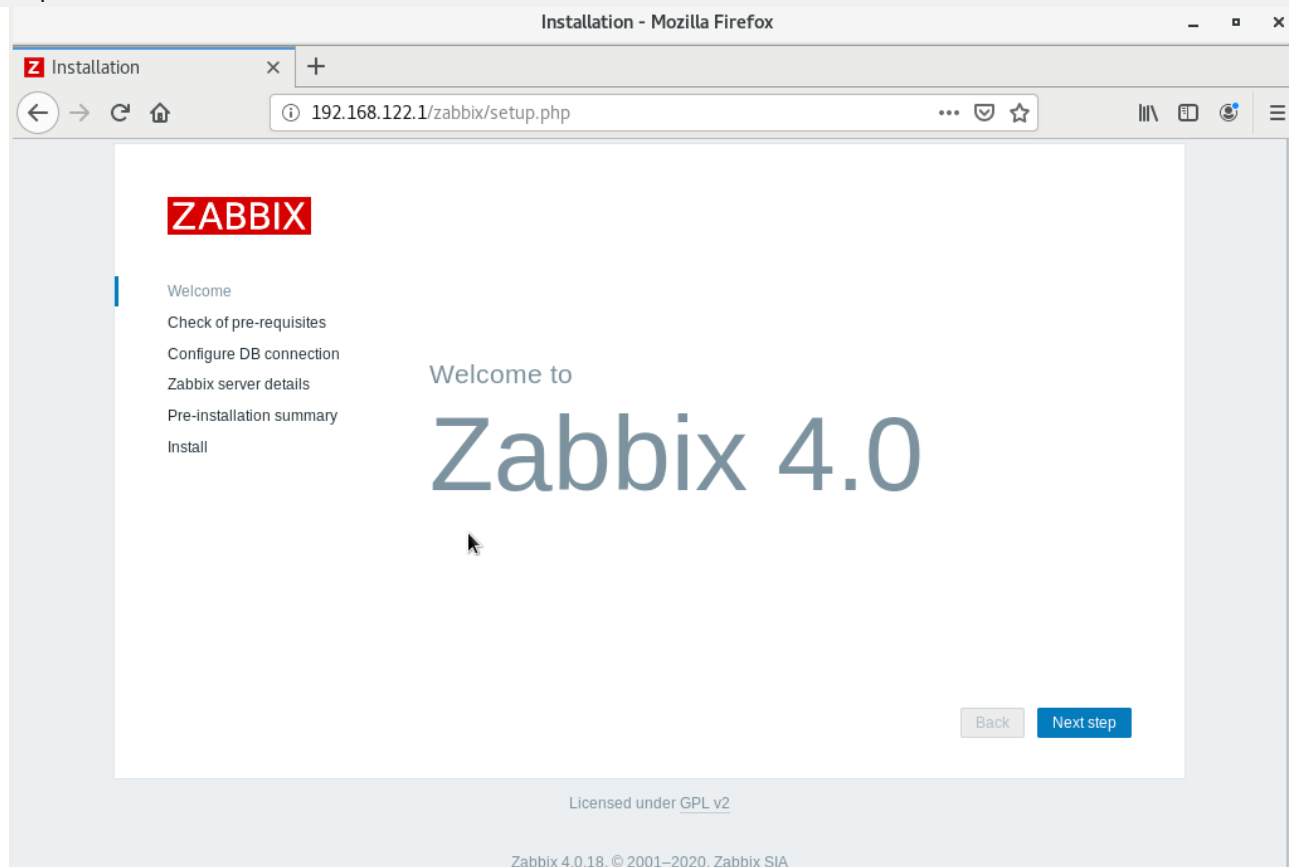
Now restart httpd service.

```
systemctl restart httpd
```

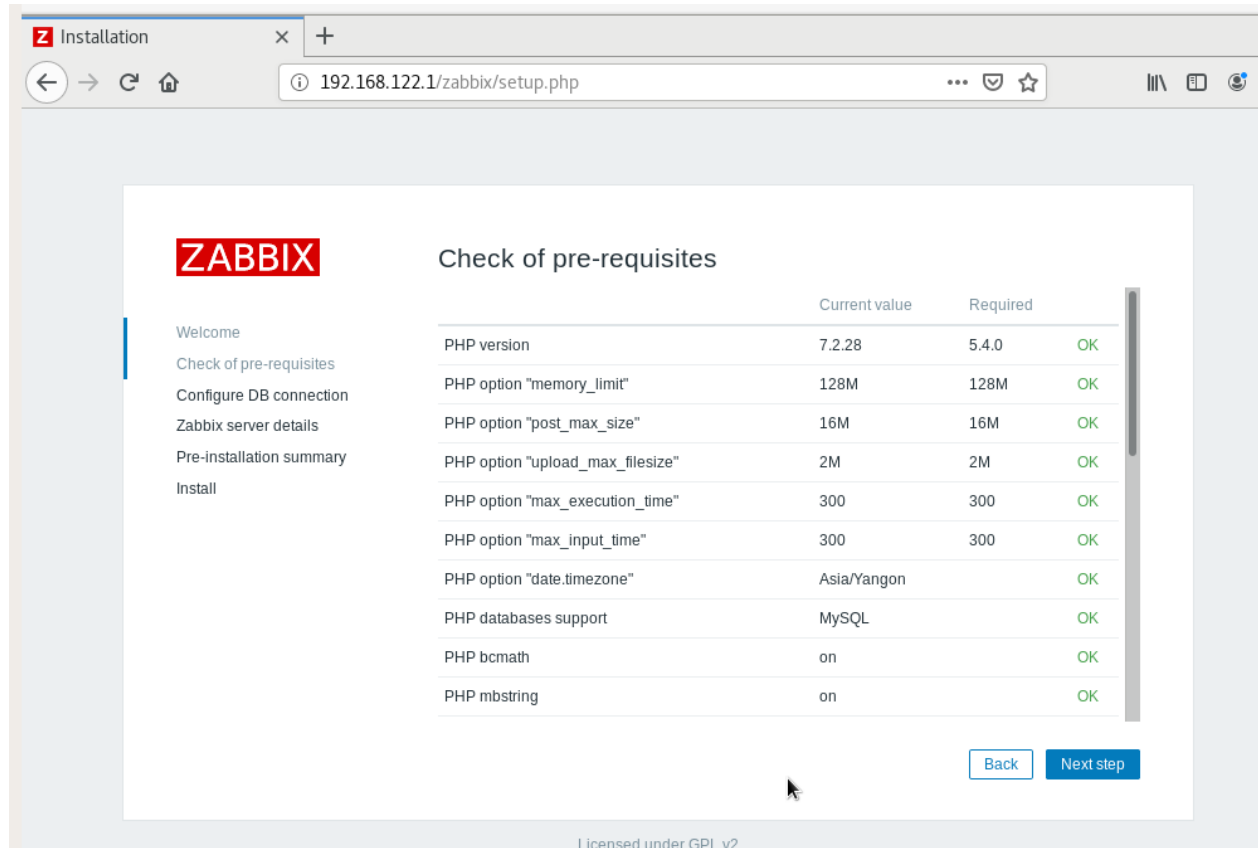
Step 9 – Setup Zabbix

You can access Zabbix using following URL:

<http://Server-Host-Name Or IP /zabbix/>



Click Next.



Here you Zabbix will check installed PHP, MySQL/MariaDB versions and parameters, etc. If you see any parameter failing, you have to modify it and refresh the page.

E.g.:- for PHP parameter you have to modify (/etc/php.ini) file. Click Next.

The screenshot shows the Zabbix installation web interface in a Firefox browser window. The address bar shows the URL `192.168.122.1/zabbix/setup.php`. The page title is "Installation - Mozilla Firefox". The Zabbix logo is in the top left. A sidebar on the left contains a list of installation steps: "Welcome", "Check of pre-requisites", "Configure DB connection" (which is highlighted), "Zabbix server details", "Pre-installation summary", and "Install". The main content area is titled "Configure DB connection" and includes the instruction: "Please create database manually, and set the configuration parameters for connection to this database. Press 'Next step' button when done." Below this, there are input fields for: "Database type" (a dropdown menu set to "MySQL"), "Database host" (text box with "localhost"), "Database port" (text box with "0" and a note "0 - use default port"), "Database name" (text box with "zabbix"), "User" (text box with "zabbixuser"), and "Password" (password field with masked characters). At the bottom right of the form are "Back" and "Next step" buttons. The footer of the page states "Licensed under GPL v2".

Configure DB Connection

Add database details and click Next. Then you will see server details, and you can add any name for “Name”.

The screenshot shows the Zabbix installation web interface in a Firefox browser window. The address bar shows the URL `10.94.10.205/zabbix/setup.php` with a "Not secure" warning. The page title is "Installation - Mozilla Firefox". The Zabbix logo is in the top left. A sidebar on the left contains a list of installation steps: "Welcome", "Check of pre-requisites", "Configure DB connection", "Zabbix server details" (which is highlighted), "Pre-installation summary", and "Install". The main content area is titled "Zabbix server details" and includes the instruction: "Please enter the host name or host IP address and port number of the Zabbix server, as well as the name of the installation (optional)." Below this, there are input fields for: "Host" (text box with "localhost"), "Port" (text box with "10051"), and "Name" (text box with "zabbix.fossilinux.com"). At the bottom right of the form are "Back" and "Next step" buttons. The footer of the page states "Licensed under GPL v2" and "Zabbix 4.0.4. © 2001–2019, Zabbix SIA".

Zabbix Server Details

Click Next. You should see the Database details and server details.

The screenshot shows the Zabbix web interface at the URL 10.94.10.205/zabbix/setup.php. The page is titled "ZABBIX" and "Pre-installation summary". On the left, there is a navigation menu with the following items: Welcome, Check of pre-requisites, Configure DB connection, Zabbix server details, Pre-installation summary (which is highlighted), and Install. The main content area displays the following configuration parameters:

Database type	MySQL
Database server	localhost
Database port	default
Database name	fossilinuxzabbix
Database user	zabbixuser
Database password	*****
Zabbix server	localhost
Zabbix server port	10051
Zabbix server name	zabbix.fossilinux.com

Below the table, there are two buttons: "Back" and "Next step". At the bottom of the page, it says "Licensed under GPL v2".

Pre-installation Summary

Click Next to complete the installation.

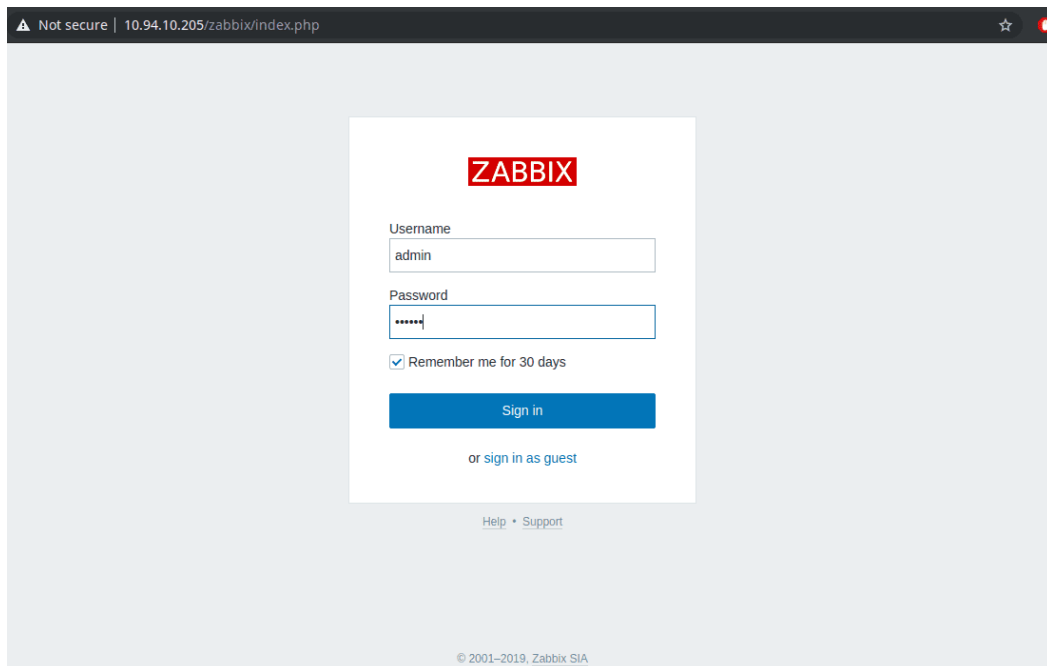
The screenshot shows the Zabbix web interface at the URL 10.94.10.205/zabbix/setup.php. The page is titled "ZABBIX" and "Install". On the left, there is a navigation menu with the following items: Welcome, Check of pre-requisites, Configure DB connection, Zabbix server details, Pre-installation summary, and Install (which is highlighted). The main content area displays the following message:

Congratulations! You have successfully installed Zabbix frontend.

Configuration file "/etc/zabbix/web/zabbix.conf.php" created.

At the bottom right, there are two buttons: "Back" and "Finish". At the bottom of the page, it says "Licensed under GPL v2".

Click finish to access the login page



Login Page

The default login name is “admin” and password is “zabbix”. You will go to the Zabbix Dashboard.

3. Zabbix Interface

Username=Admin

Password=zabbix

We can log in to the zabbix interface.

3.1 Zabbix initial frontend screen

The screenshot shows the Zabbix initial frontend screen in Mozilla Firefox. The browser window title is "Zabbix-Tool: Dashboard - Mozilla Firefox". The address bar shows the URL "192.168.122.1/zabbix/zabbix.php?action=dashb". The Zabbix logo is visible in the top left corner. The navigation menu includes "Monitoring", "Inventory", "Reports", "Configuration", and "Administration". The "Monitoring" menu is expanded, showing sub-menus: "Dashboard", "Problems", "Overview", "Web", "Latest data", "Graphs", "Screens", "Maps", "Discovery", and "Services". The "Global view" is selected. The "System information" section displays the following data:

Parameter	Value	Details
Zabbix server is running	Yes	localhost:10051
Number of hosts (enabled/disabled /templates)	94	4 / 0 / 90
Number of items (enabled/disabled/not supported)	133	125 / 0 / 8
Number of triggers	52	52 / 0 [4 / 48]

The "Problems by severity" section displays the following data:

Host group	Disaster	High	Average	Warning	Information	Not classified
Linux servers						1
Web pages						1
Zabbix servers			1	1		

The bottom of the screen shows the browser tab "Zabbix-Tool: Dashboard - Mozilla Fir..." and the page number "1 / 4".

There are five categories in the navigation bar:



Monitoring : This category contains most of the monitoring-related pages. We can view data, problems and graphs here.

Inventory : Inventory data for monitored system can be viewed.

Report: This section contains some simple reports.

Configuration: Setting up everything related to the monitoring of systems, parameters, notification sending, and so on happens here.

Administration: This section allows you to set up more of the Zabbix internals, including authentication, methods, users, permission, and global Zabbix configuration.

3.2 System Information

Click on **Report** and then click on **System information**, the very first report:

The screenshot displays the Zabbix 4.0.17 System Information page. The browser window title is 'Zabbix-Tool: System information - Mozilla Firefox'. The address bar shows the URL '192.168.122.1/zabbix/zabbix.php?action=report'. The Zabbix logo is visible in the top left, and the navigation menu includes Monitoring, Inventory, Reports, Configuration, and Administration. The 'System information' section is active, showing a table of system metrics.

Parameter	Value	Details
Zabbix server is running	Yes	localhost:10050
Number of hosts (enabled/disabled/templates)	94	4 / 0 / 90
Number of items (enabled/disabled/not supported)	133	125 / 0 / 8
Number of triggers (enabled/disabled [problem/ok])	52	52 / 0 [4 / 48]
Number of users (online)	2	1
Required server performance, new values per second	1.75	

Zabbix 4.0.17. © 2001–2020, Zabbix SIA

Here, System informations are shown.

Number of hosts are 94 by default in zabbix server.

Number of items are 76 by default. Here is the adding items .

Number of users is 2 by default in zabbix tool, **Admin** and **Guest**. Here, We enable the admin of zabbix .So, 1 is in the **Detail** column

There are also many informations in the Zabbix tool .The above informations are a part of that I'll make the monitoring and you can also search more information.

4. Monitoring

There are a lot of monitorings using zabbix. Among them, we will make the Web Monitoring of the websites.

With Zabbix, we can check several availability aspect of website.

4.1 Configuration

4.1.1 Create a new host

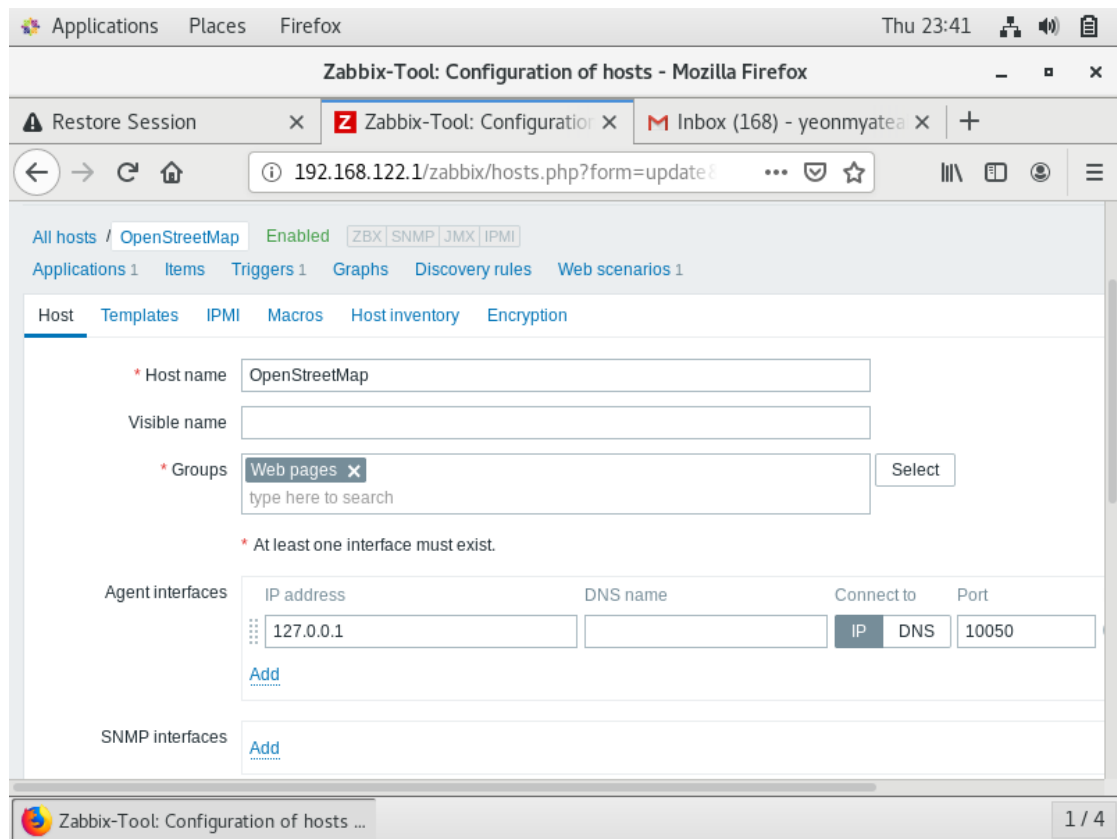
There is an existing default host called Zabbix Server by default. But in our monitoring, we create a dedicated host called **OpenStreetMap**.

Navigate to **Configuration | Hosts**, click on **Create host**, and fill in these values:

- ❖ **Name:** OpenStreetMap
- ❖ **Groups:** Web pages

Group-we need to choose a related group because all access permissions are assigned to host groups, not individual hosts.

In this configuration, we will make web monitoring so choose **Web pages** group.



4.1.2 Create a scenario

To activate web monitoring we need to define **web scenarios**. A web scenario consists of one or several HTTP requests or “**steps**”. The steps are periodically executed by Zabbix server in a pre-defined order.

In the list of hosts, click on **Web** next to *OpenStreetMap*.

Click on Create web scenario. In the scenario properties, enter these values:

Name : Main page
New application : Webpage
Update interval : 300

The screenshot shows the 'Zabbix-Tool: Configuration of web monitoring' page in Mozilla Firefox. The browser's address bar shows the URL '192.168.122.1/zabbix/httpconf.php?form=update'. The page has tabs for 'Scenario', 'Steps', and 'Authentication'. The 'Steps' tab is active, showing a form with the following fields:

- * Name: Main Page
- Application: Webpage
- New application: (empty field)
- * Update interval: 300
- * Attempts: 1
- Agent: Zabbix
- HTTP proxy: [protocol://][user[:password]@]proxy.example.com[:port]

Below the form is a 'Variables' section with a table:

Name	Value
name	value

There is an 'Add' link below the table and a 'Remove' link next to the 'value' field. At the bottom, there is a 'Headers' section with a table:

Name	Value
------	-------

The bottom of the page shows a status bar with 'Zabbix-Tool: Configuration of web ...' and '1 / 4'.

Application- it will show the items of web scenario in group in Monitoring | latest data.

Update interval-How often the scenario will be executed.

Next, The Steps for web monitoring are the actual queries performed on the web server.

Switch to the Steps tab and click on Add in the Steps section.

The form is :

The screenshot shows the 'Step of web scenario' configuration window. It includes fields for Name ('First page'), URL ('http://www.openstreetmap.org/'), and a Parse button. Below these are sections for Query fields, Post type (Form data/Raw data), Raw post, Variables, and Headers, each with a table for Name and Value. At the bottom, there are checkboxes for Follow redirects and Retrieve only headers, a Timeout field (15s), and Required string and status codes fields. The Required string field contains the text 'OpenStreetMap is a map of the world. created by people like you' and the Required status codes field contains '200'. Update and Cancel buttons are at the bottom right.

Name	Value
name	value

Name	Value
name	value

Name	Value
name	value

Follow redirects ☒

Retrieve only headers ☐

* Timeout 15s

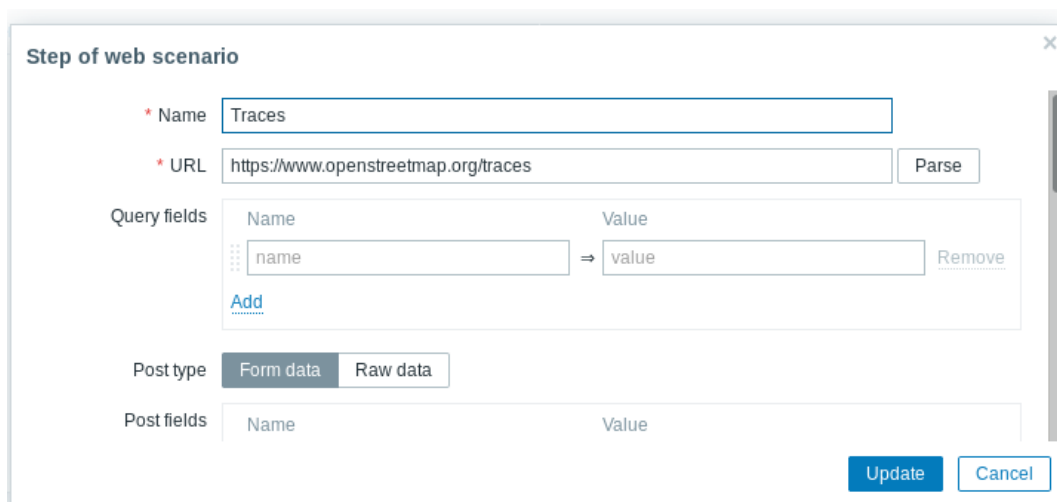
Required string OpenStreetMap is a map of the world. created by people like you

Required status codes 200

URL- The values must be the actual address of website. Otherwise, this step will be fail.

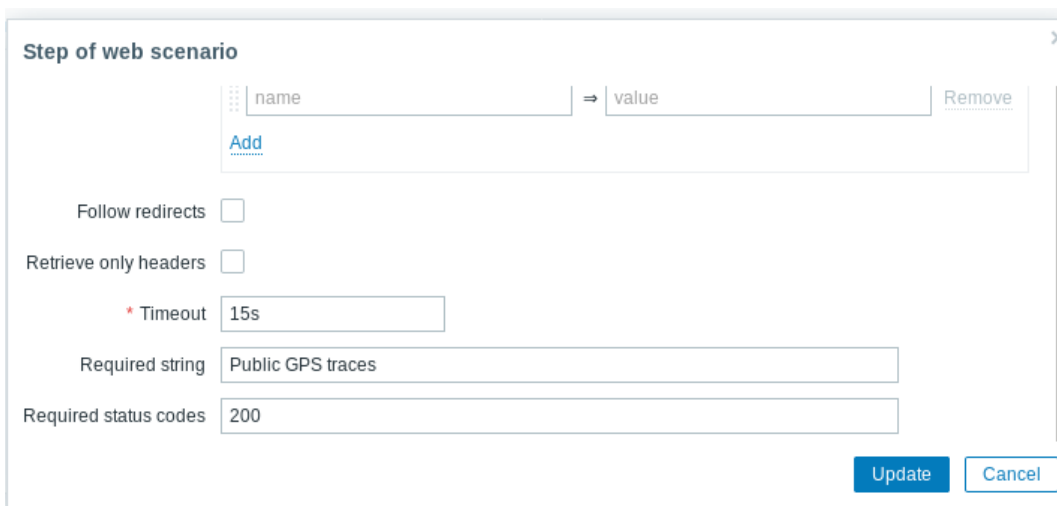
Required string- This field will search for a particular string in the returned page, and it will fail if such a string is not found.

Requires status codes- Enter 200.Here, The return code doesn't match, this step is a failure. A status code of 200 means OK-the website is available and no downtime.



This screenshot shows the top portion of the 'Step of web scenario' dialog box. It includes fields for 'Name' (Traces) and 'URL' (https://www.openstreetmap.org/traces), with a 'Parse' button next to the URL. Below these is a 'Query fields' section with a table containing one row: 'name' in the 'Name' column and 'value' in the 'Value' column, with an 'Add' button and a 'Remove' button. At the bottom of this section are 'Post type' buttons for 'Form data' (selected) and 'Raw data'. Below that is a 'Post fields' section with a table header 'Name' and 'Value'. 'Update' and 'Cancel' buttons are at the bottom right.

Name	Value
name	value



This screenshot shows the bottom portion of the 'Step of web scenario' dialog box. It includes a table with one row: 'name' in the 'Name' column and 'value' in the 'Value' column, with an 'Add' button and a 'Remove' button. Below this are checkboxes for 'Follow redirects' and 'Retrieve only headers'. There is a 'Timeout' field set to '15s'. Below that are 'Required string' (Public GPS traces) and 'Required status codes' (200) fields. 'Update' and 'Cancel' buttons are at the bottom right.

Name	Value
name	value

4.2 Result of Website

Open Monitoring | Web and click on Main page next to OpenStreetMap.

The screenshot shows a Mozilla Firefox browser window displaying the Zabbix web monitoring details page. The address bar shows the URL `192.168.122.1/zabbix/httpdetails.php?httptestk`. The Zabbix logo is visible in the top left, and the navigation menu includes Monitoring, Inventory, Reports, Configuration, and Administration. The 'Web' tab is selected under the Monitoring section. The page title is 'Details of web scenario: Main Page'. A table displays the monitoring results for a web scenario, showing Step, Speed, Response time, and Response code. The table includes rows for 'First Page', 'Traces', and a 'TOTAL' row. Below the table, there are input fields for 'From' (now-15m) and 'To' (now), an 'Apply' button, and a list of time range options: Last 2 days, Yesterday, Today, Last 7 days, Day before yesterday, Today so far, Last 30 days, This day last week, This week, Last 3 months, Previous week, and This week so far. The bottom status bar shows 'Zabbix-Tool: Details of web scenario...' and '1 / 4'.

Step	Speed	Response time	Response code
First Page	5.35 KBps	2s 664.3ms	200
Traces	37.19 KBps	669.2ms	200
TOTAL		3s 333.5ms	

We can see the result of website we monitored.

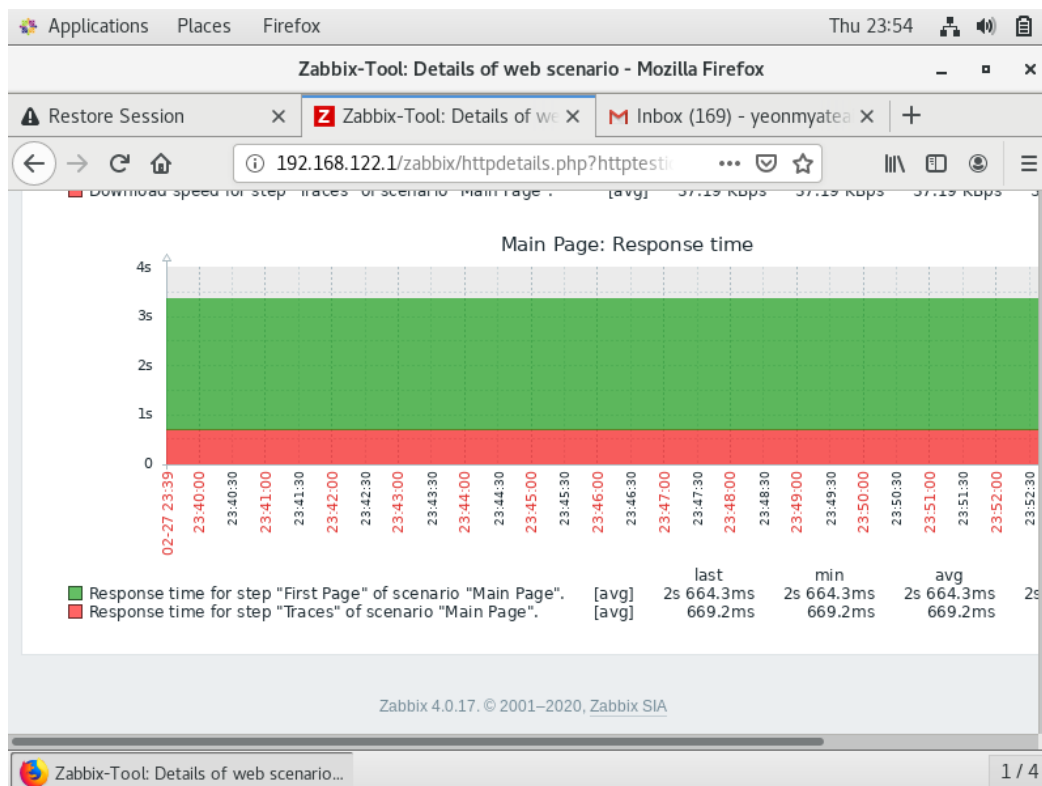
The information collected by the web scenario

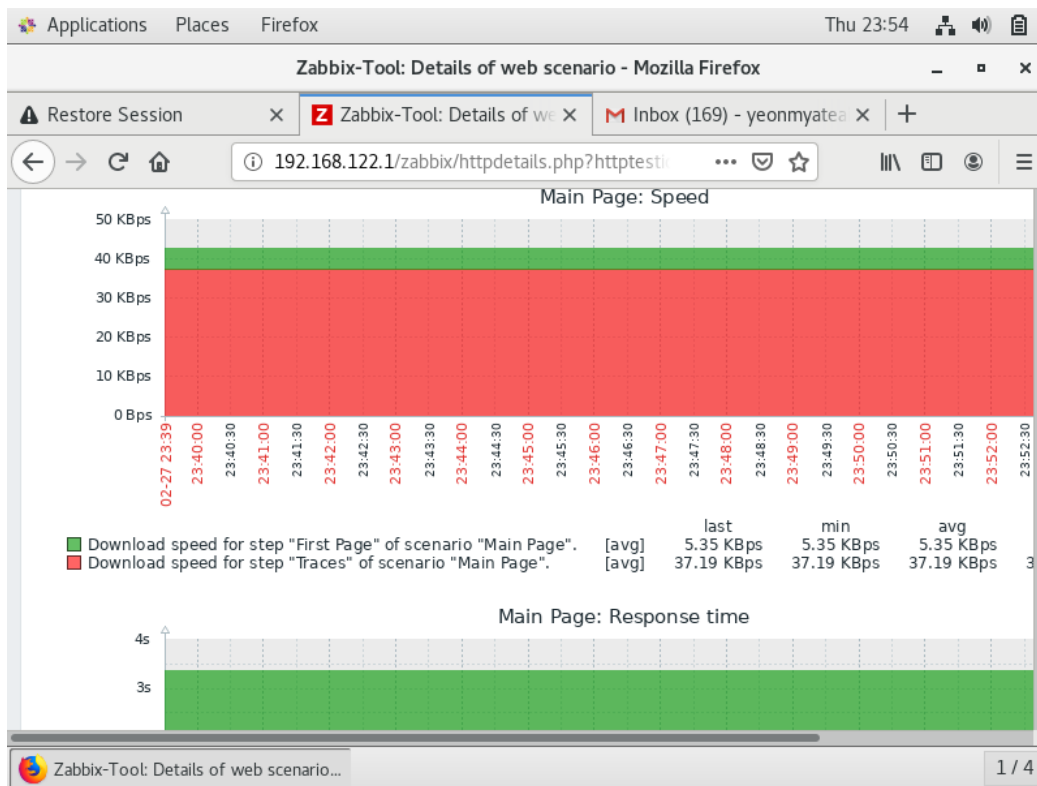
- Download speed per second
- Response time
- Response code

There are more information collected by the scenario

- Average download speed per second for all steps of whole scenario
- Number of the step that failed
- Last error message

The result will be shown by graph





4.3 Using agent items

There are three web page-related item keys:

- *web.page.get*
- *web.page.perf*
- *web.page.regexp*

4.3.1 Getting the page

The simplest web page-related agent item key, *web.page.get*, allows us to retrieve page content.(HTTP request)

Navigate to **Configuration | Hosts**, and select **Linux servers** in the Group, Drop-down

Click on Items next to **A test host**, and click on **Create item**. Fill in the following values:

The screenshot shows the Zabbix configuration interface for creating a new item. The form includes the following fields and options:

- Name:** UITpage Content
- Type:** Zabbix agent
- Key:** web.page.get[https://www.uit.edu.mm/moodle/] (with a Select button)
- Host interface:** 127.0.0.1 : 10050
- Type of information:** Text
- Update interval:** 30s
- Custom intervals:** A table with columns Type, Interval, Period, and Action. It contains one row with Type Flexible, Scheduling, Interval 50s, Period 1-7,00:00-24:00, and Action Remove. There is an Add button below the table.
- History storage period:** Do not keep history (selected) and Storage period 90d (with a mouse cursor over it).
- New application:** A text input field.
- Applications:** A dropdown menu with options -None-, UIT, and UIT frontend.

Another web page-related agent item is *web.page.perf*. It returns the loading time of the page in seconds.(performance)

Click on **Create item**, and fill in the following :

Item

Preprocessing

* Name

UIT main page load time

Type

Zabbix agent

* Key

web.page.perf[https://www.uit.edu.mm/moodle/]

Select

* Host interface

127.0.0.1 : 10050

Type of information

Numeric (float)

Units

s

* Update interval

30s

Custom intervals

Type	Interval	Period	Action
<div>Flexible</div> <div>Scheduling</div>	50s	1-7,00:00-24:00	<div>Remove</div>

Add

* History storage period

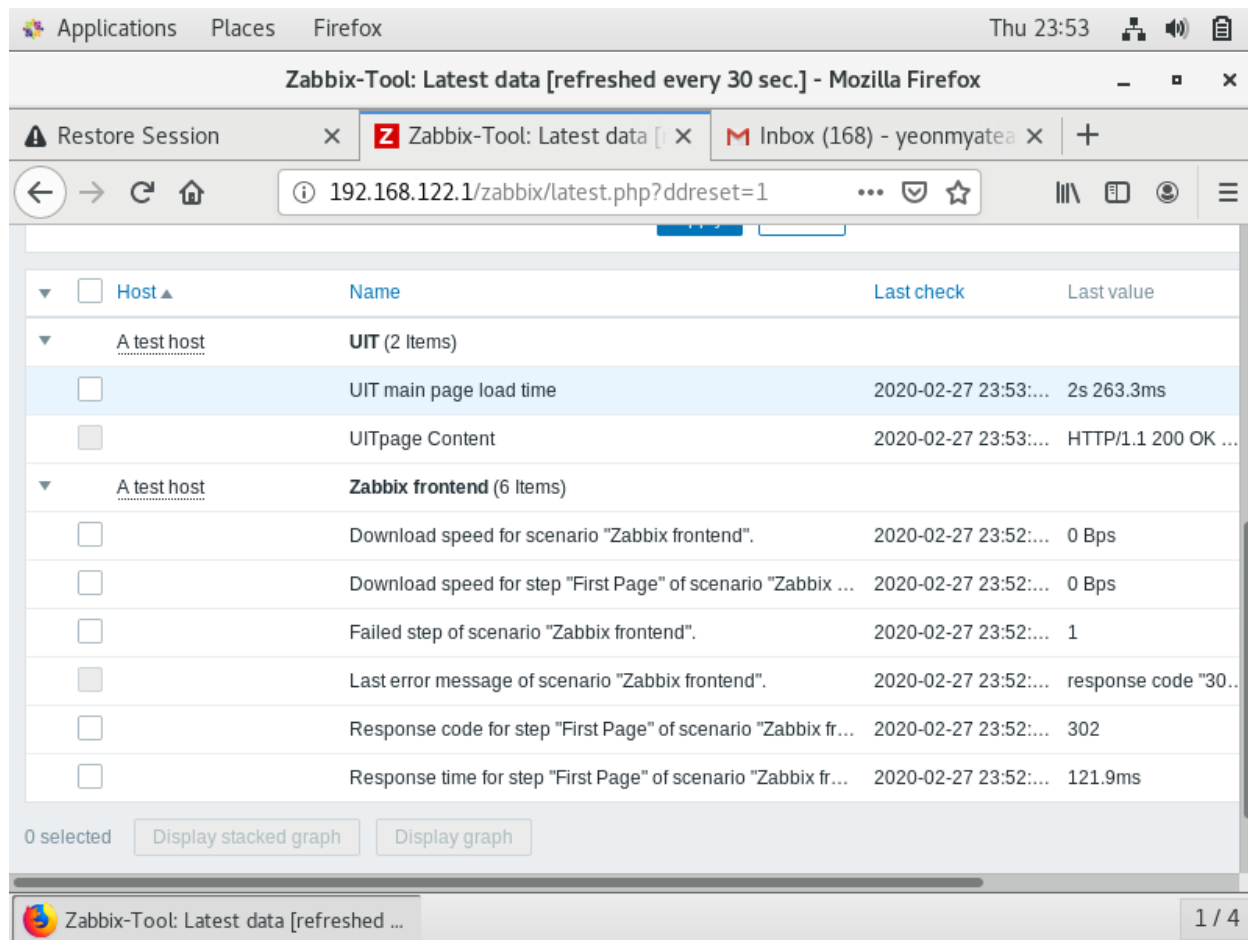
Do not keep history

Storage period

90d

4.3.3 Showing Result

Now we will see the result provided by the web agent.

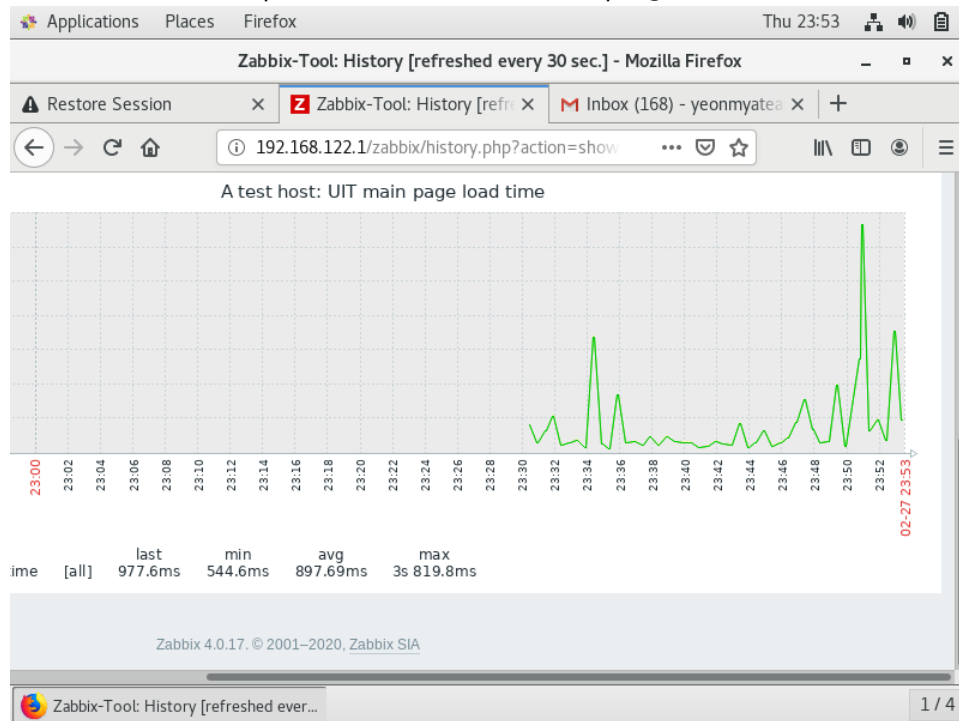


The screenshot shows a Mozilla Firefox browser window with the title "Zabbix-Tool: Latest data [refreshed every 30 sec.] - Mozilla Firefox". The address bar shows the URL "192.168.122.1/zabbix/latest.php?ddreset=1". The page content displays a table of monitoring items for two hosts: "A test host" and "Zabbix frontend".

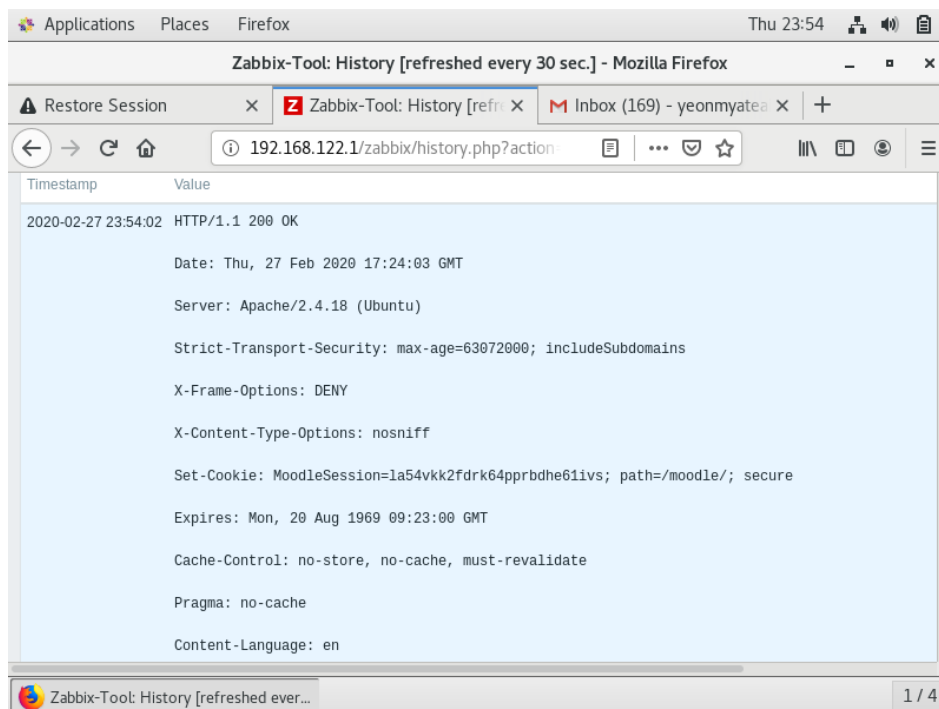
Host	Name	Last check	Last value
A test host	UIT (2 Items)		
	UIT main page load time	2020-02-27 23:53:...	2s 263.3ms
	UITpage Content	2020-02-27 23:53:...	HTTP/1.1 200 OK ...
A test host	Zabbix frontend (6 Items)		
	Download speed for scenario "Zabbix frontend".	2020-02-27 23:52:...	0 Bps
	Download speed for step "First Page" of scenario "Zabbix ...	2020-02-27 23:52:...	0 Bps
	Failed step of scenario "Zabbix frontend".	2020-02-27 23:52:...	1
	Last error message of scenario "Zabbix frontend".	2020-02-27 23:52:...	response code "30..
	Response code for step "First Page" of scenario "Zabbix fr...	2020-02-27 23:52:...	302
	Response time for step "First Page" of scenario "Zabbix fr...	2020-02-27 23:52:...	121.9ms

At the bottom of the table, there are buttons for "Display stacked graph" and "Display graph". The status bar at the bottom shows "Zabbix-Tool: Latest data [refreshed ...]" and "1 / 4".

By graph, we can see the performance of the page



We can know the HTTP of the page



4.4: Alerting on web scenario

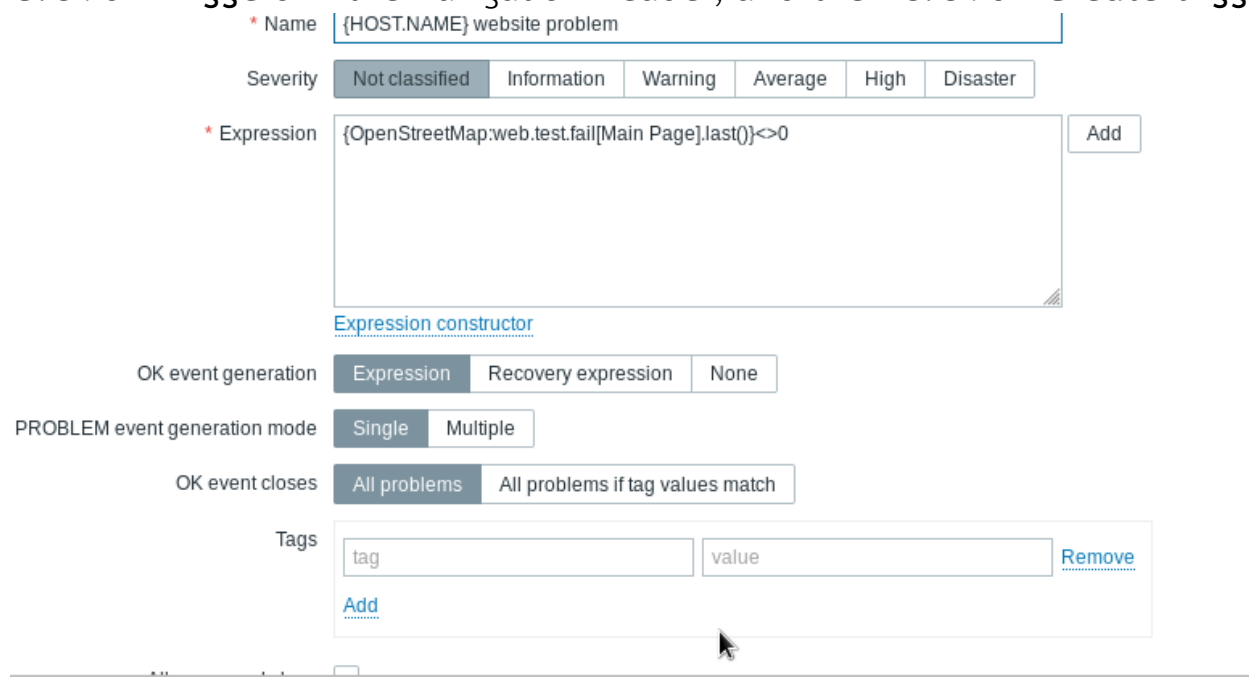
Let's create a trigger that warns us when any one of the steps in the scenario fails. If the failed step item holds 0, all is good. Otherwise, the web scenario will stop at any failure, and we cannot know other states.

4.4.1: Creating Trigger

Item- the basic of gathering data in Zabbix.

Trigger- To atomically evaluate incoming data we need to define triggers. A trigger can expression that defines a threshold of what is an acceptable level of the data.

Click on **Triggers** in the navigation header, and then click on **Create trigger**.



The screenshot shows the 'Create trigger' form in Zabbix. The form includes the following fields and options:

- Name:** {HOST.NAME} website problem
- Severity:** Not classified, Information, Warning, Average, High, Disaster
- Expression:** {OpenStreetMap:web.test.fail[Main Page].last()}<>0
- Expression constructor:** A link to the expression constructor.
- OK event generation:** Expression, Recovery expression, None
- PROBLEM event generation mode:** Single, Multiple
- OK event closes:** All problems, All problems if tag values match
- Tags:** A table with columns 'tag' and 'value', and a 'Remove' button.
- Add:** A button to add a new tag.

Name : {HOST.NAME} website problem.

Expression: Click on **Add**, then click on **Select** next to the **Item** field in the resulting popup. Select **Web pages** in the **Group** drop-down and **OpenStreetMap** in the **Host** drop-down.

Then, click on **Failed step of scenario Main page** in the **Name** column. In the **Function** drop-down, choose **last()** - Last (most recent T value).

For Result, choose **<>** and **0**.

In the **Item** field, you can choose another items for the limit of website you want to get.

Items

Group

Web pages

Host

OpenStreetMap

Download speed for step "First Page" of scenario "Main Page".	web.test.in[Main Page,First Page,bps]	Web monitoring	Numeric (float)	Enabled
Download speed for step "Traces" of scenario "Main Page".	web.test.in[Main Page,Traces,bps]	Web monitoring	Numeric (float)	Enabled
Failed step of scenario "Main Page".	web.test.fail[Main Page]	Web monitoring	Numeric (unsigned)	Enabled
Last error message of scenario "Main Page".	web.test.error[Main Page]	Web monitoring	Character	Enabled
Response code for step "First Page" of	web.test.rspcode[Main Page,First	Web	Numeric	Enabled

Cancel

Apply

Reset

Severity	Value	Name ▲	Expression	Status
Not classified	OK	{HOST.NAME} website problem	{OpenStreetMap:web.test.fail[Main Page].last()}<>0	Enabled

Display

4.4.2: Setting up Email for Notification

First, go to the **terminal**

Install ssmtp server

```
# yum install ssmtp //in CentOS7
```

```
# sudo apt-get update, sudo apt-get install ssmtp //In Ubuntu
```

Next, edit the file,

```
#vi /etc/ssmtp/ssmtp.conf
```

```
root= yourmail@gmail.com
```

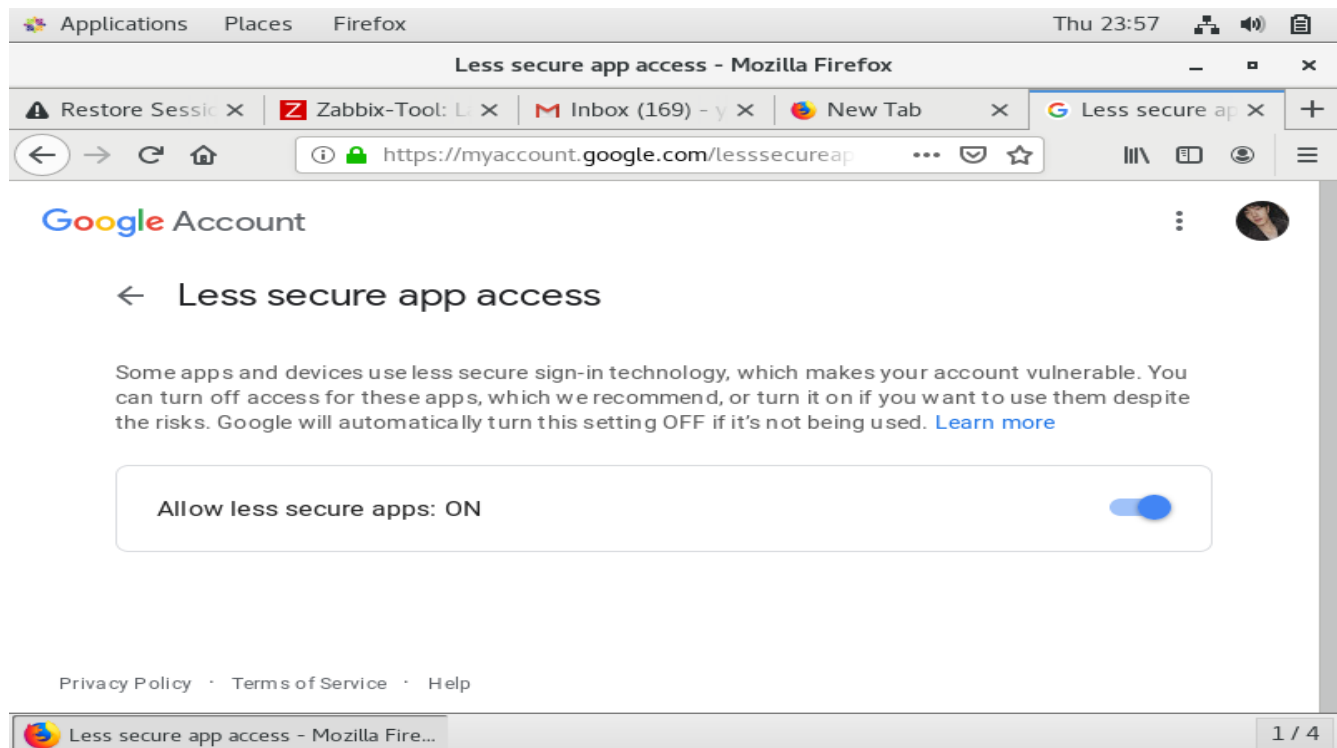
```
mailhub=smtp.gmail.com:465
```

```
FromLineoverride=YES
```

```
UseTLS=YES
```

And save the file

Next, you need to turn on Gmail account



To configure the parameters for sending emails, do the following:

1. Open **Administration** | Media types
- 2 Click on **Email** in the **Name** column

Fill like the following :

Media type

Options

* Name

Email

Type

Email

* SMTP server

smtp.gmail.com

SMTP server port

465

* SMTP helo

gmail.com

* SMTP email

your@gmail.com

Connection security

None

STARTTLS

SSL/TLS

SSL verify peer

☐

SSL verify host

☐

Authentication

None

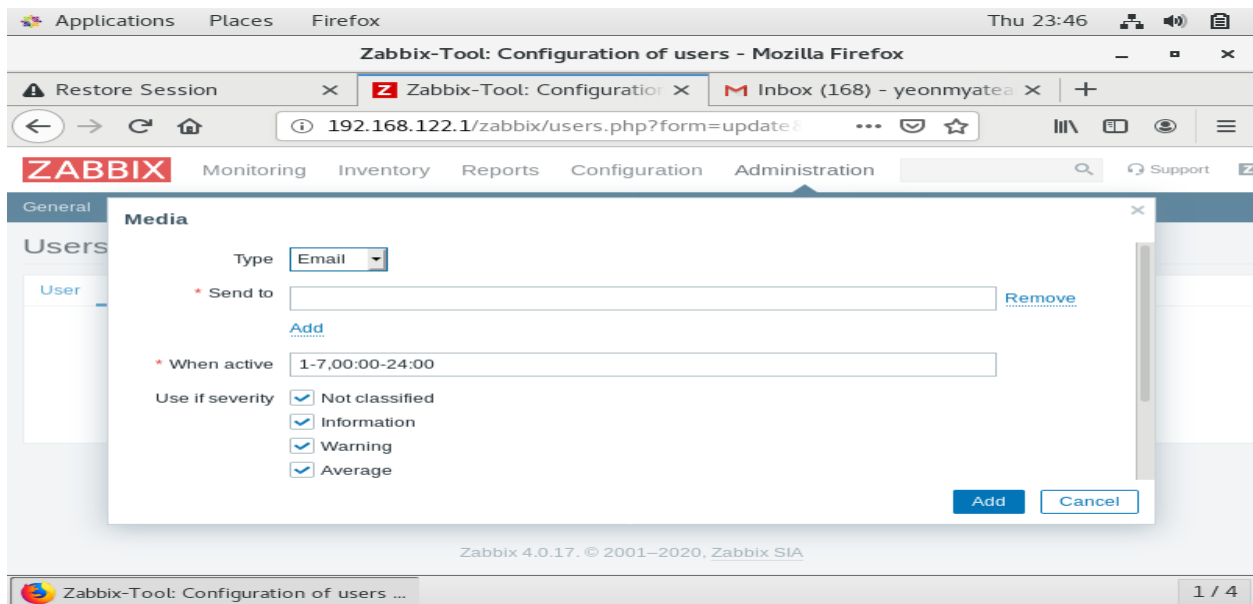
Username and password

Username

your@gmail.com

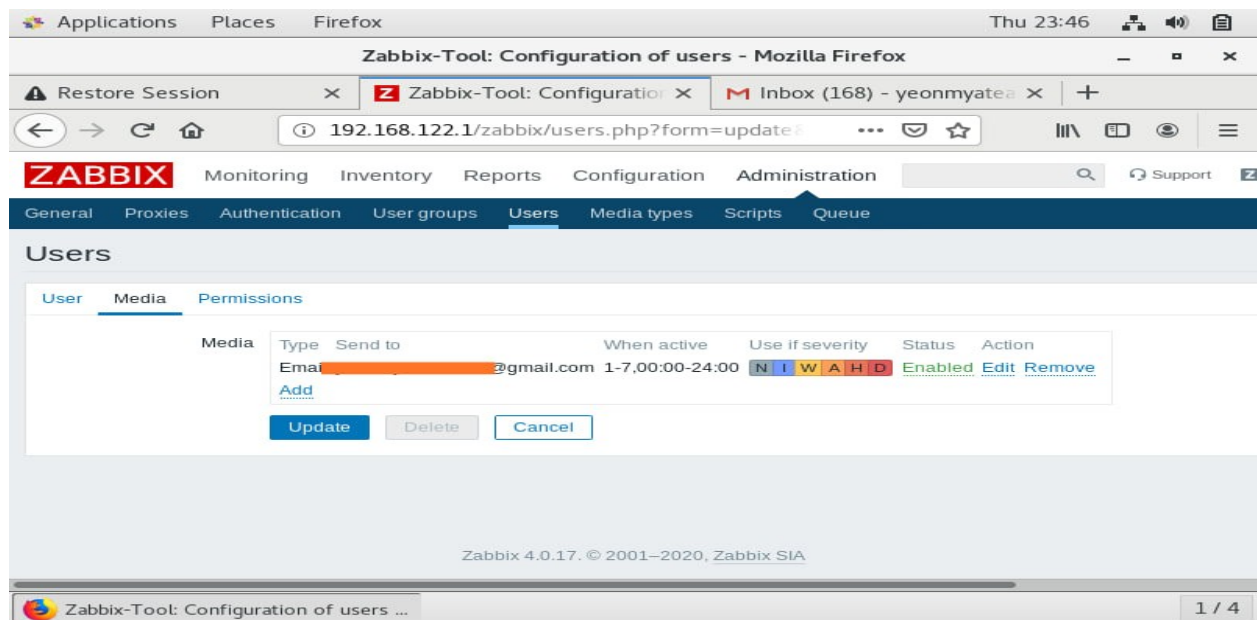
To assign an email address to a user, take the following steps:

1. Open **Administration** | Users. You should see only two users: **Admin** and **Guest**
- 2 Click on **Admin** in the **Alias** column and switch to the **Media** tab, as follow :



Send to: fill the yourmail@gmail.com.

Here is the summary of the Admin user-email configuration.



Now we set up email for the notification about the problem of website.

4.4.3 Creation Action

- 1.Go to the **Monitoring** in the Navigation bar and click **Action** tab
- 2.Click on **Create action**. (Make sure that the drop-down box **Event source** in the top-right corner has **Triggers** selected).

A form is presented that lets you configure preconditions and the action to take

The screenshot shows the Zabbix 4.0.17 'Create Action' form. The 'Action' tab is selected. The form includes a 'Name' field with the value 'OpenstreetMap Problem'. Below this is a 'Conditions' table with one condition: 'A: Trigger equals OpenStreetMap: OpenStreetMap website problem'. There is a 'New condition' section with a dropdown for 'Trigger name', a dropdown for 'contains', and an 'Add' button. There is an 'Enabled' checkbox checked. At the bottom, there is a message: '* At least one operation, recovery operation or update operation must exist.' and buttons for 'Update', 'Clone', 'Delete', and 'Cancel'.

- 3.First, enter a name for your new action, such as Test action, and add a new condition by selecting **Trigger** and =.
- 4.Next, use the Select button to select the trigger that you made on your test host.(The trigger created above)
- 5.Click Add, then select the **Operations** checkbox, and select **Send message** for Operation type.

6. Next, select **Admin** as the user to send the recovery message under **Send to Users** and click **Add**:

And do like this for **Recovery operation**:

The screenshot shows the 'Operation details' form. It includes fields for 'Steps' (1 - 1), 'Step duration' (0), and 'Operation type' (Send message). A note states: '* At least one user or user group must be selected.' Below this are sections for 'Send to User groups' and 'Send to Users', each with an 'Add' button. The 'Send only to' dropdown is set to '- All -'. The 'Default message' checkbox is checked. At the bottom, there is a 'Conditions' table with columns 'Label', 'Name', and 'Action', and a 'New' button.

The result is like this

The screenshot shows the 'Recovery operations' tab. It includes fields for 'Default operation step duration' (1h), 'Default subject' (Problem: {EVENT.NAME}), and 'Default message' (a template with placeholders for event details). A checkbox for 'Pause operations for suppressed problems' is checked. Below is a table of operations with columns 'Steps', 'Details', 'Start in', and 'Duration'. The first row shows '1 Send message to users: Admin (Zabbix Administrator) via all media Immediately Default'. A note at the bottom states: '* At least one operation, recovery operation or update operation must exist.'

In the configuration,

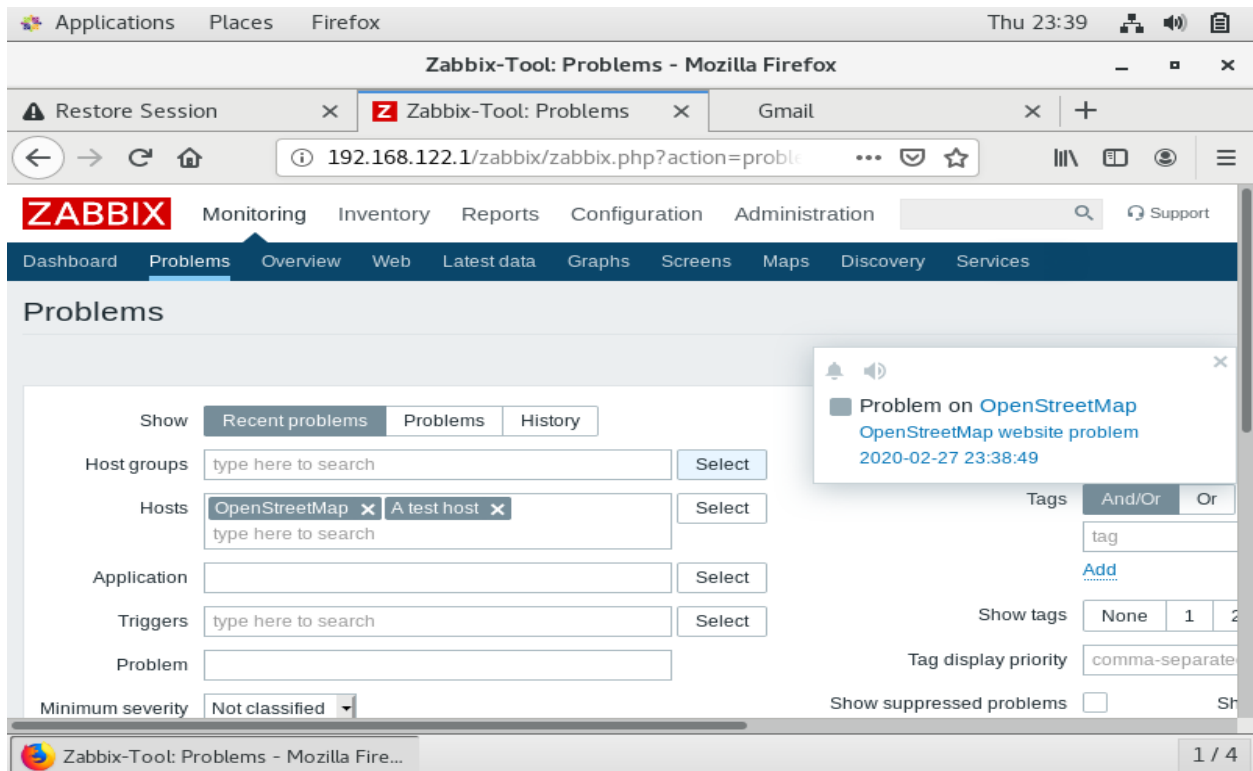
- We create a host(OpenStreetMap), which contains an item (**web.test.fail**, default 6 items for web monitoring).
- A trigger reference this item. Whenever the trigger expression matches the current item value, the trigger switches to the **PROBLEM** state.
- When it cease to match, it switches back to the **OK** state.

4.4.4 Causing problem in web scenario

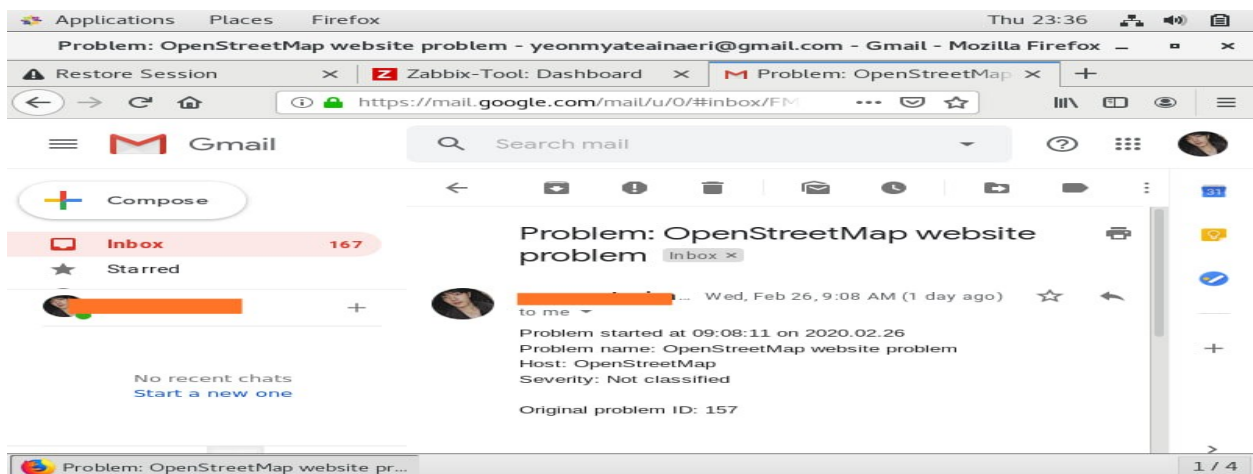


In this figure, the **URL** link in the steps of scenario is not correct. So, Status column like this message and the the step is fail .

Next, alarm-box will be appear like this

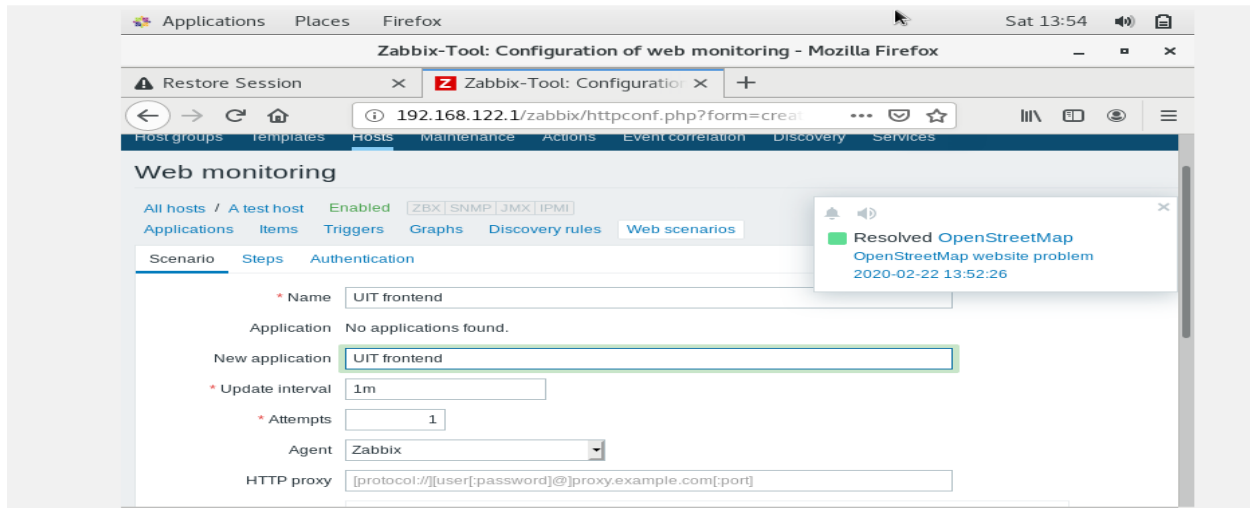


And ,the email will be sent :

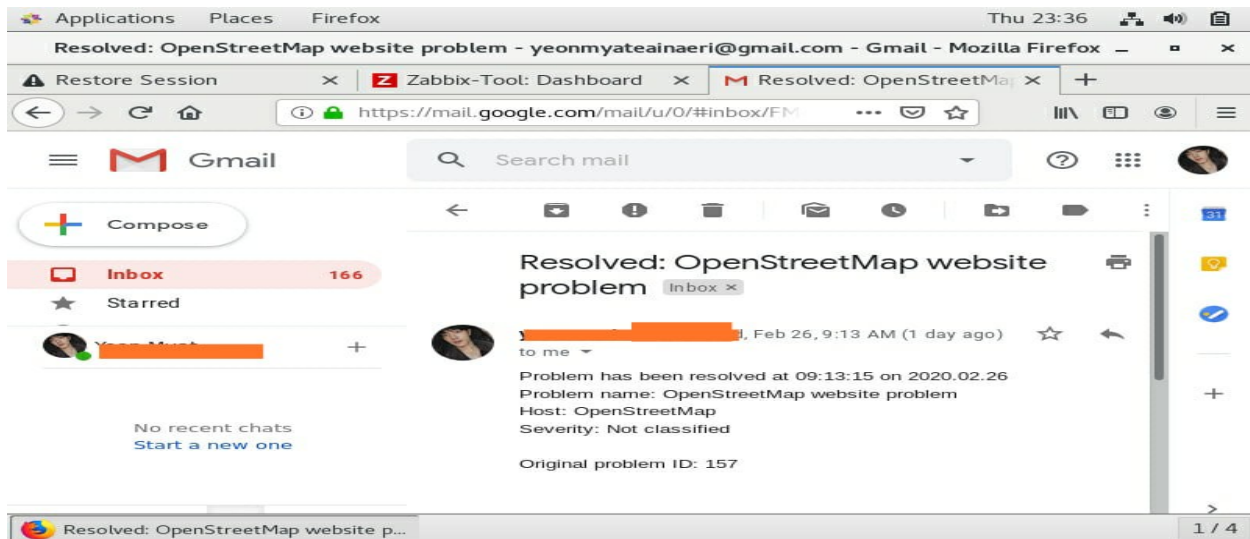


So, we need to check the steps and URL links

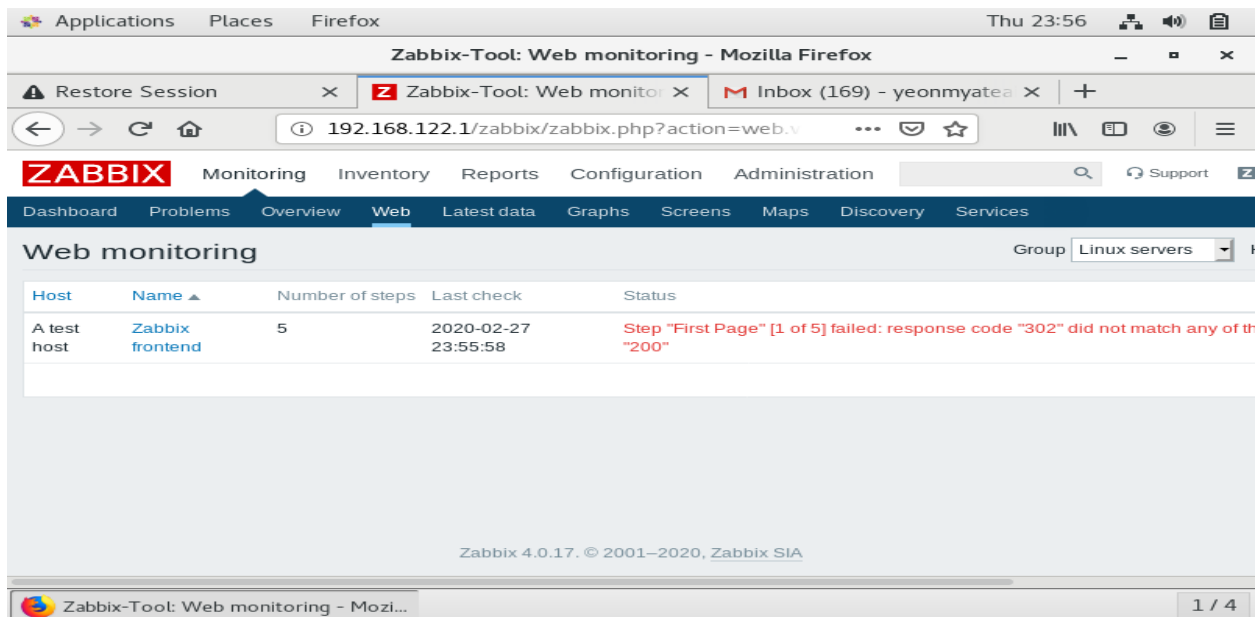
When we solved the problem and the notification is delivered.



In the Email,



Another error may be :



Here, We need to know List of HTTP status code – Status codes are issued by a server in response to a client’s request made to the server. There are five classes defined by the standard

- **1xx informational response** – the request was received, continuing process
- **3xx redirection** – further action needs to be taken in order to complete the request
- **4xx client error** – the request contains bad syntax or cannot be fulfilled
- **5xx server error** – the server failed to fulfil an apparently valid request

Now we can see the problem in Available report like this

Host	Name	Problems	OK
A test host	website problem	100.0000%	0
OpenStreetMap	OpenStreetMap website problem	66.5556%	3
Zabbix server	/etc/passwd has been changed on Zabbix server		1
Zabbix server	Configured max number of opened files is too low on Zabbix server		1
Zabbix server	Configured max number of processes is too low on Zabbix server		1
Zabbix server	Disk I/O is overloaded on Zabbix server		1
Zabbix server	Free disk space is less than 20% on volume /	100.0000%	
Zabbix server	Free disk space is less than 20% on volume /boot		1
Zabbix server	Free inodes is less than 20% on volume /		1
Zabbix server	Free inodes is less than 20% on volume /boot		1
Zabbix server	Host information was changed on Zabbix server		1
Zabbix server	Host name of zabbix_agentd was changed on Zabbix server		1
Zabbix server	Hostname was changed on Zabbix server		1

Note: You need to access Internet in the whole configuration

There are many monitoring things by Zabbix Tool like network, system, service and so on.

You can also search and monitor other network.

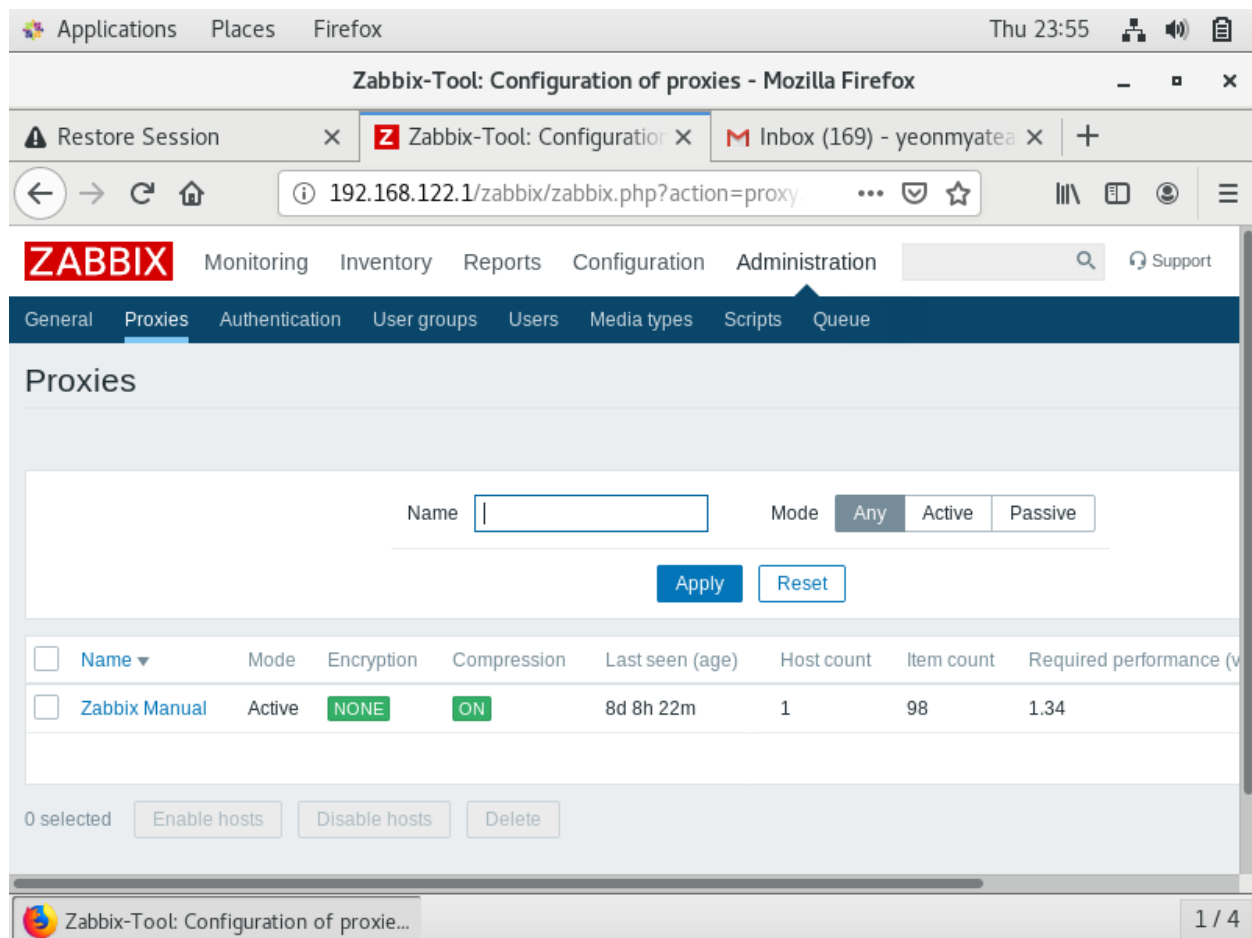
From above web monitoring, we can know

- ◆ The availability of website (like response code “200” is OK and “400” means the website is down).
- ◆ Performance of the website
- ◆ The header (HTTP) content of webpage

- ◆ The speed of website

We also learn trigger, item and action and how to monitor the remote network using zabbix agent and zabbix proxy.

4.5.Zabbix Proxy



We install proxy in terminal and can choose mode in configuration file.

5. Current Application of Zabbix

5.1.Companies using Zabbix

Companies around the world rely on Zabbix monitoring solution owing to its advanced features and robust performance. Among Zabbix customers and users are institutions and enterprises of different sizes operating in such industries as Finance and Insurance, IT&T, Healthcare and Public Sector, Food and Manufacture, Education and Retail and many other economy sectors.

- ARI network services 2, Inc USA (<http://www.arinet.com/>)
- ziw Telecom and media UAE (<https://www.ziwo.io/>)
- Alya S.r.l Italy (<http://www.alya.it/>)

5.1.1.Companies Providing Zabbix services in Myanmar

1.One Cloud Company Limited (<http://www.1cloudtechnology.com/>)

2.NEX4 (<https://nex4.net/>)

6.Pros & Cons

6.1.Pros of Zabbix

- ◆ easy to understand.
- ◆ scale without limits. provide installation on virtualization platforms.
- ◆ monitor and graph anything with built-templates.
- ◆ can monitor both Linux and Windows environments.
monitoring, sending alerts by email, integration with other tools, solid community.
- ◆ provides the configurability and granularity that enterprises demand, and delivers fast discovery.

6.2.Cons of Zabbix

- ◆ requires a lot of manual configuration and has some limits on exportable reports.
- ◆ Building out Zabbix metrics that suit your environment can be very time consuming.
- ◆ no window version for zabbix proxy.
- ◆ steep learning curve.

- ◆ resource hungry.

7.Reference

- <https://www.zabbix.com/documentation/current/manual>
- <https://www.fosslinux.com/7705/how-to-install-and-configure-zabbix-on-centos-7.htm>
- <https://en.wikipedia.org/wiki/Zabbix>
- Zabbix 4 network Monitoring pdf