Raspberry PI 'How-To' Series

Zabbix Server
Installation Guide

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Introduction

Zabbix is a popular open-source platform used by IT professionals all over the world to monitor their security infrastructure. The list of companies that use the platform is impressive.

Figure 1: Zabbix dashboard

One of the really cool things about Zabbix is they have ported the platform to Raspian. What this means is you can run the enterprise version of Zabbix on a Rapsberry Pi. Why would we want to do this? For all the same reasons we do anything with a Pi. Because it is available to us.

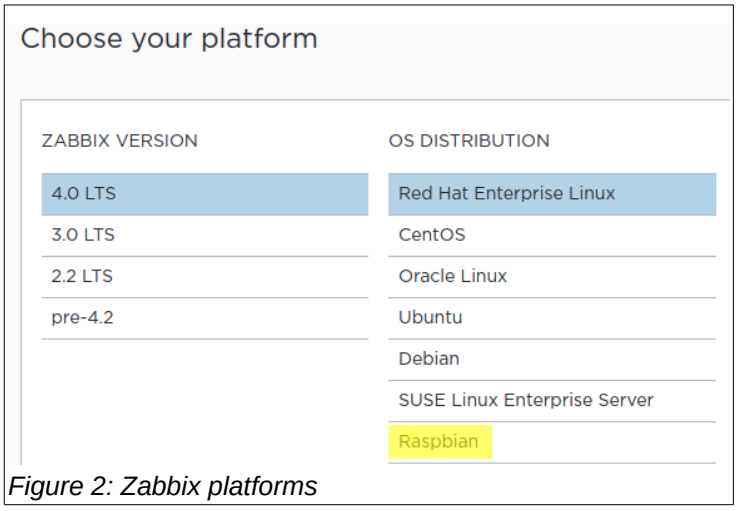

Figure 2: Zabbix platforms

This guide walks through the process of installing Zabbix on a Raspberry Pi. Once we get the Zabbix server up and running, we will deploy Zabbix agents to a couple of Rapsberry Pi's and create a dashboard to monitor them.

Step-by-Step

In this guide, I will install the Zabbix server platform on a Raspberry Pi3.

There are 7 steps to installing Zabbix.

1. Get your Pi up and running with Raspian Stretch
2. Download and install Zabbix
3. Install MySQL database
4. Install Zabbix frontend
5. Secure MySQL installation
6. Create Zabbix database
7. Configure Zabbix Frontend
8. Zabbix Agent installation

Step-1 - Get your Pi up and running with Raspian Stretch.

The first thing you need to do is get your Pi running. Head out to *raspberrypi.org* and download *Raspian Stretch* or *Stretch Lite.* The former has a Window GUI while the latter is a command-line only OS. Either one works. I will be installing *Stretch Lite.*

Once the download completes, burn the image to an SD card and fire up your Pi. If you need help with this step, there is a ton of resources on the web to help you. When you are up and running and connected to the Internet, be sure to update your Pi with the latest patches.

$sudo apt-get update
$sudo apt-get upgrade
$sudo reboot

Step-2 – Download and install Zabbix

The Zabbix platform includes complete and well-written documentation. We will follow the installation section (Section 4) of the documentation suite to guide us through the installation.

Log int to your Pi and open a command window.

Enter the below commands as shown in Figures 3, 4, and 5:

$sudo wget https://repo.zabbix.com/zabbix/4.0/raspbian/pool/main/z/zabbix-release/zabbix-release_4.0-2+stretch_all.deb

$ sudo dpkg -i zabbix-release_4.0-2+stretch_all.deb

$sudo apt update

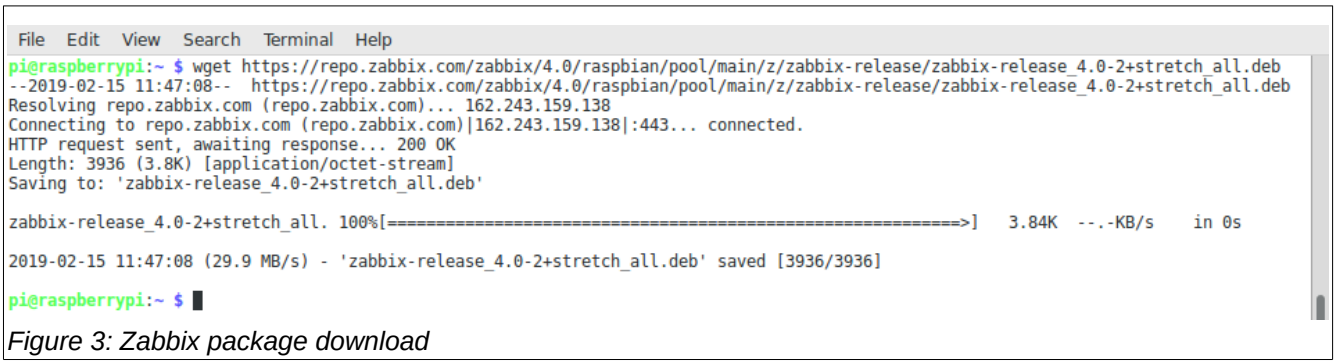

Figure 3: Zabbix package download

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ sudo dpkg -i zabbix-release_4.0-2+stretch_all.deb
Selecting previously unselected package zabbix-release.
(Reading database ... 34729 files and directories currently installed.)
Preparing to unpack zabbix-release_4.0-2+stretch_all.deb ...
Unpacking zabbix-release (1:4.0-2+stretch) ...
Setting up zabbix-release (1:4.0-2+stretch) ...
pi@raspberrypi:~ $
```

Figure 4: Zabbix package install

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ sudo apt update
Get:1 http://repo.zabbix.com/zabbix/4.0/raspbian stretch InRelease [4,932 B]
Hit:2 http://archive.raspberrypi.org/debian stretch InRelease
Get:3 http://repo.zabbix.com/zabbix/4.0/raspbian stretch/main Sources [1,170 B]
Get:4 http://repo.zabbix.com/zabbix/4.0/raspbian stretch/main armhf Packages [3,771 B]
Hit:5 http://raspbian.raspberrypi.org/raspbian stretch InRelease
Fetched 9,873 B in 5s (1,661 B/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
pi@raspberrypi:~ $
```

Figure 5: Apt update

Step-3 – Install MySQL database

Zabbix requires a database. You have a choice between MySQL or Postgres. I will be installing MySQL. Enter the below command to install MySQL:

$sudo apt install zabbix-server-mysql

Figure-6 below shows the successful install of MySQL.

```
File  Edit  View  Search  Terminal  Help
Setting up libreadline5:armhf (5.2+dfsg-3) ...
Setting up libpci3:armhf (1:3.5.2-1) ...
Setting up libfcgi-perl (0.78-2) ...
Setting up libdbi-perl (1.636-1+b1) ...
Setting up libopenipmi0 (2.0.22-1.1) ...
Setting up libsnmp-base (5.7.3+dfsg-1.7+deb9u1) ...
Setting up libhttp-date-perl (6.02-1) ...
Setting up libsnmp30:armhf (5.7.3+dfsg-1.7+deb9u1) ...
Setting up libodbc1:armhf (2.3.4-1) ...
Setting up libhtml-template-perl (2.95-2) ...
Setting up snmpd (5.7.3+dfsg-1.7+deb9u1) ...
adduser: Warning: The home directory `/var/lib/snmp' does not belong to the user you are currently c
reating.
Created symlink /etc/systemd/system/multi-user.target.wants/snmpd.service -> /lib/systemd/system/snm
pd.service.
Setting up mariadb-server-core-10.0 (10.0.28-2+b1) ...
Setting up libcgi-fast-perl (1:2.12-1) ...
Setting up mariadb-client-core-10.0 (10.0.28-2+b1) ...
Setting up libhttp-message-perl (6.11-1) ...
Setting up libdbd-mysql-perl (4.041-2) ...
Setting up mariadb-client-10.0 (10.0.28-2+b1) ...
Setting up zabbix-server-mysql (1:4.0.4-1+stretch) ...
Setting up mariadb-server-10.0 (10.0.28-2+b1) ...
Processing triggers for libc-bin (2.24-11+deb9u3) ...
Processing triggers for systemd (232-25+deb9u8) ...
pi@raspberrypi:~ $
```

Figure 6: MySQL install

Step-4 – Install Zabbix frontend

The Zabbix frontend is the web server component of the platform. Install it using the below command.

$sudo apt install zabbix-frontend-php. This is shown in Figure 7.

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ sudo apt install zabbix-frontend-php
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils fontconfig-config fonts-dejavu-core
  libapache2-mod-php libapache2-mod-php7.0 libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libfontconfig1 libgd3 liblua5.2-0 libwebp6 libxpm4 libxslt1.1 php-bcmath
  php-common php-gd php-ldap php-mbstring php-mysql php-xml php7.0-bcmath php7.0-cli php7.0-common
  php7.0-gd php7.0-json php7.0-ldap php7.0-mbstring php7.0-mysql php7.0-opcache php7.0-readline
  php7.0-xml ssl-cert ttf-dejavu-core
Suggested packages:
  www-browser apache2-doc apache2-suexec-pristine | apache2-suexec-custom php-pear libgd-tools
  openssl-blacklist
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils fontconfig-config fonts-dejavu-core
  libapache2-mod-php libapache2-mod-php7.0 libapr1 libaprutil1 libaprutil1-dbd-sqlite3
  libaprutil1-ldap libfontconfig1 libgd3 liblua5.2-0 libwebp6 libxpm4 libxslt1.1 php-bcmath
  php-common php-gd php-ldap php-mbstring php-mysql php-xml php7.0-bcmath php7.0-cli php7.0-common
  php7.0-gd php7.0-json php7.0-ldap php7.0-mbstring php7.0-mysql php7.0-opcache php7.0-readline
  php7.0-xml ssl-cert ttf-dejavu-core zabbix-frontend-php
0 upgraded, 39 newly installed, 0 to remove and 0 not upgraded.
Need to get 9,973 kB of archives.
After this operation, 41.7 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Figure 7: Install Zabbix frontend

Step-5 – Secure MySQL installation

It is important that we secure the MySQL database engine and set a root password. To do this enter the below command:

$sudo mysql_secure_installation

NOTE: Be sure to remember the root password.

This is shown below in Figure 8 and 9.

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ sudo 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]
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
```

Figure 8: Secure MySQL

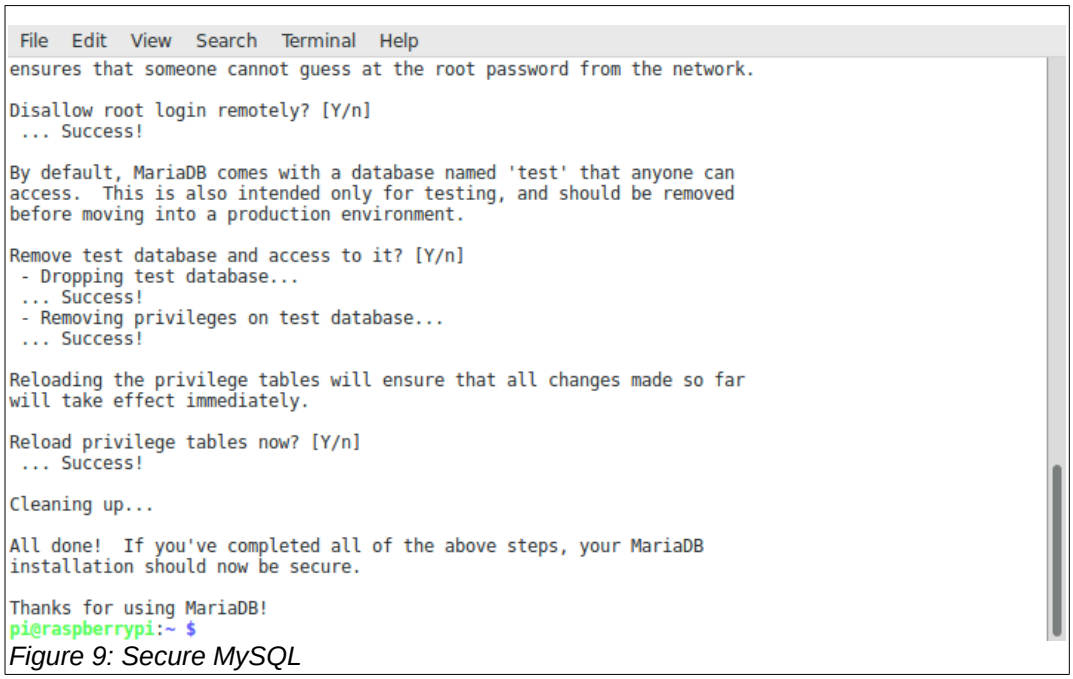

Figure 9: Secure MySQL

Step-6 – Create Zabbix database

Create the Zabbix database from the MySQL command line. Use the root password you entered in Step-5.

```
$sudo mysql -uroot -p
```

From the MySQL prompt enter the below command:

```
shell> mysql -uroot -p<password>
mysql> create database zabbix character set utf8 collate utf8_bin;
mysql> grant all privileges on zabbix.* to zabbix@localhost identified by '<password>';
mysql> quit;
```

This is shown below in Figure 10.

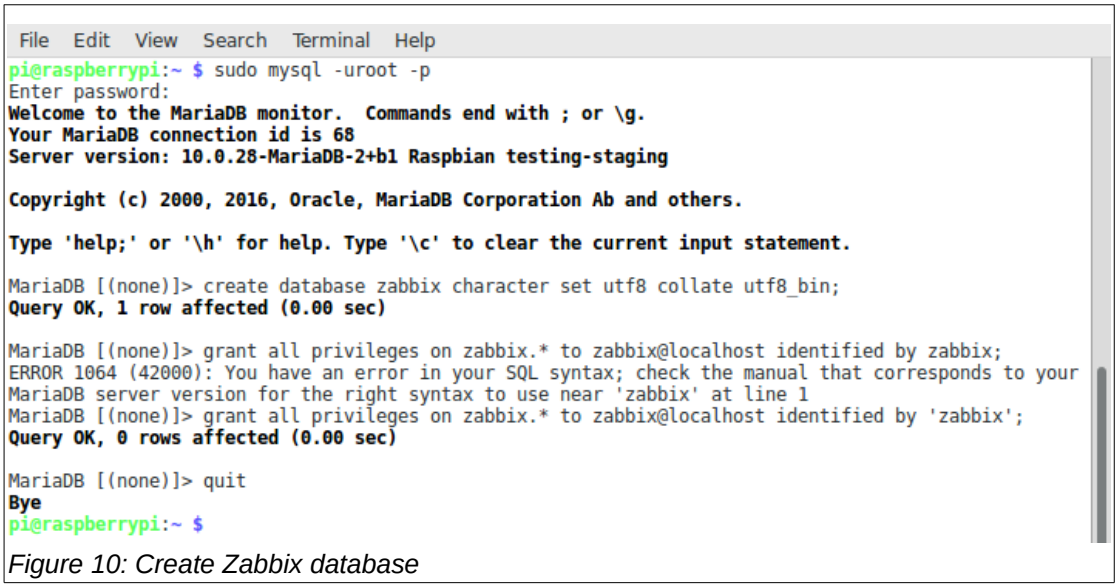

Figure 10: Create Zabbix database

Create the database from the schema file using the below command:

$sudo zcat /usr/share/doc/zabbix-server-mysql/create.sql.gz | mysql -uzabbix -p zabbix

This is shown in Figure 11.

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ zcat /usr/share/doc/zabbix-server-mysql/create.sql.gz | mysql -uzabbix -p zabbix
Enter password:
pi@raspberrypi:~ $
```

Figure 11: Create Zabbix database

Next, provide the server the information it needs about the MySQL database.

$sudo nano etc/zabbix/zabbix_server.conf

Edit the below entries in the configuration file to the correct database settings:

DBHost=localhost

DBName=zabbix

DBUser=zabbix

DBPassword=<password>

This is shown below in Figure 12. (DBHost=localhost entry not shown)

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.7.4                File: /etc/zabbix/zabbix_server.conf                Modified

#       Database name.
#
# Mandatory: yes
# Default:
# DBName=

DBName=zabbix

### Option: DBSchema
#       Schema name. Used for IBM DB2 and PostgreSQL.
#
# Mandatory: no
# Default:
# DBSchema=

### Option: DBUser
#       Database user.
#
# Mandatory: no
# Default:
# DBUser=

DBUser=zabbix

### Option: DBPassword
#       Database password.
#       Comment this line if no password is used.
#
# Mandatory: no
# Default:
DBPassword=zabbix

### Option: DBSocket

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify  ^C Cur Pos  ^Y Prev Page
^X Exit      ^R Read File  ^\ Replace   ^U Uncut Text ^T To Spell ^_ Go To Line ^V Next Page
```

Figure 12: Server database configuration

Sart the Zabbix server as shown in 13.

$sudo service zabbix-server start

```
File  Edit  View  Search  Terminal  Help
pi@raspberrypi:~ $ sudo service zabbix-server start
pi@raspberrypi:~ $
```

Figure 13: Server start

Update the rc daemon so the server starts automatically on system startup. Figure 14.

$sudo update-rc.d zabbix-server enable

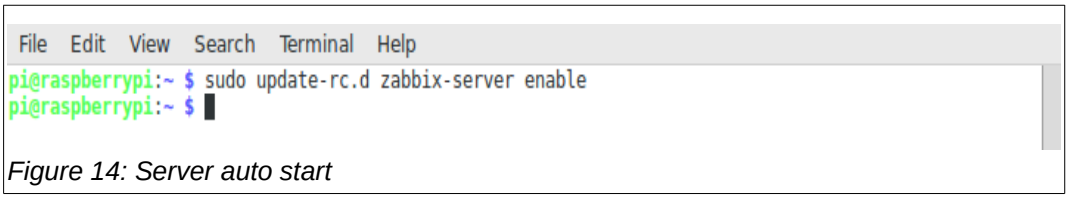

Figure 14: Server auto start

Also restart the Apache web service. Figure 15.

$sudo service apache2 restart

Figure 15: Apache restart

Step-7 – Zabbix Frontend configuration

In this step you will configure the Zabbix frontend (web application).

Open the frontend configuration file and set your local timezone. Figure 16.

$sudo nano /etc/apache2/conf-enabled/zabbix.conf.

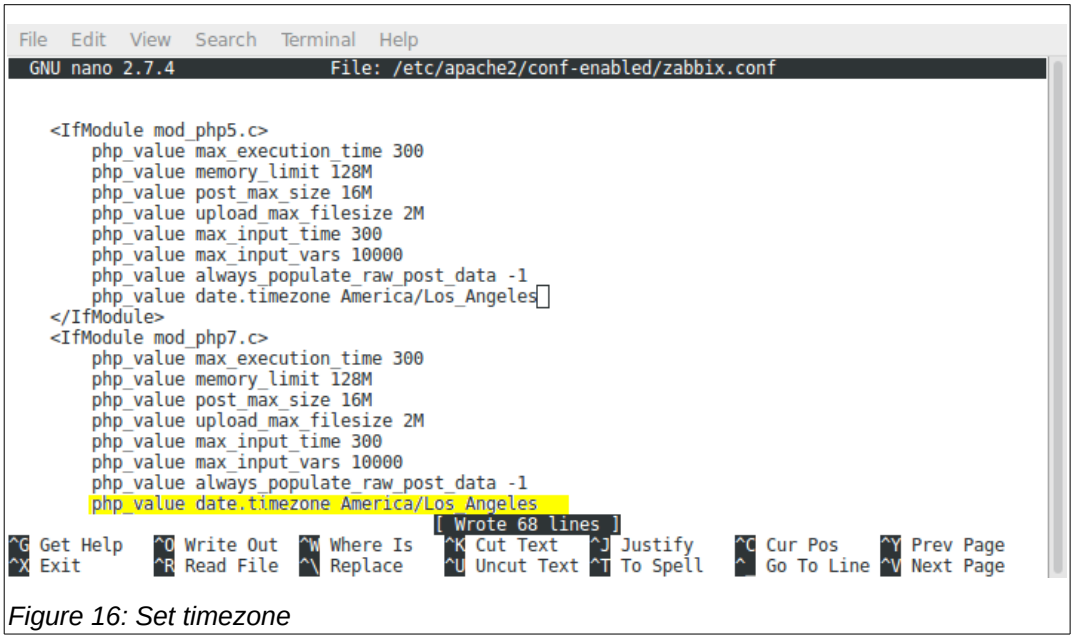

Figure 16: Set timezone

Save the file <Ctrl>o <Enter> <Ctrl>x.

In your browser, open Zabbix : http://<server_ip_or_name>/zabbix.

If everything is working correctly, you should see the Zabbix Welcome screen as shown in Figure 17.

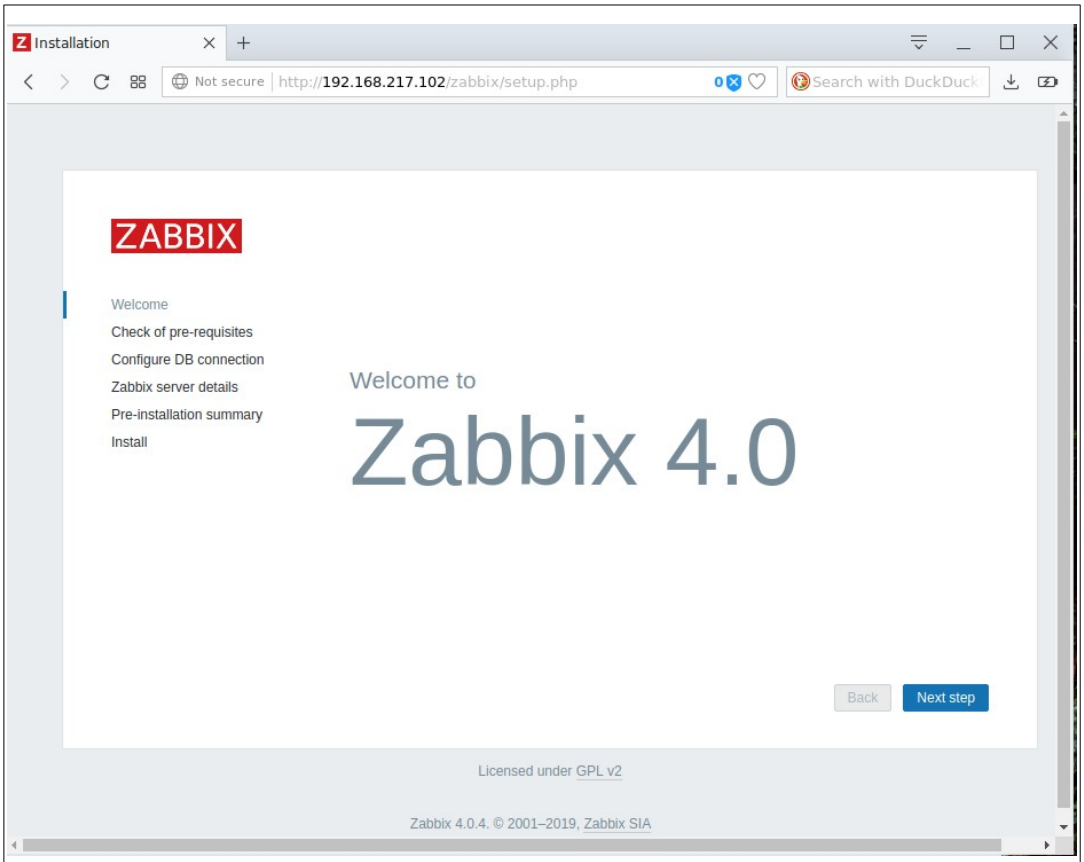

Figure 17: Zabbix welcome screen

Click on the <Next step> button. You will see the 'pre-requisites' screen as shown in Figure 18.

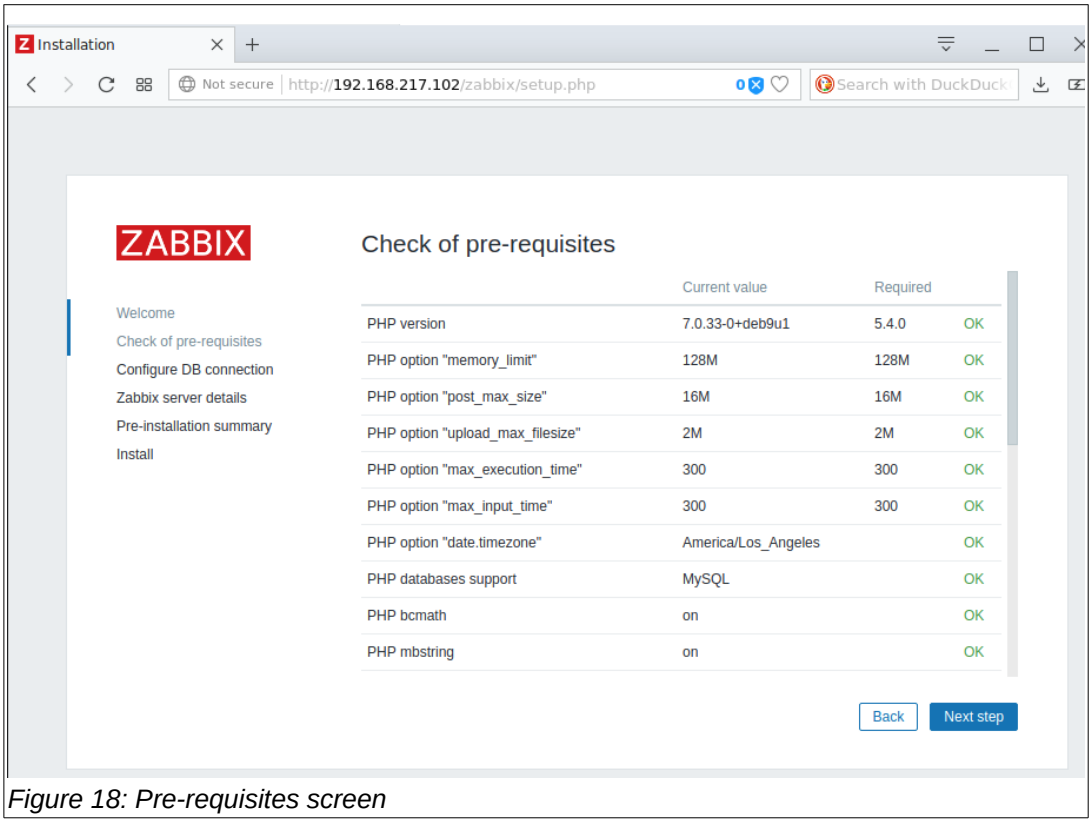

Figure 18: Pre-requisites screen

If all of the pre-requisites have been met, you should see a full column of green Ok's on the right.

Click on the <Next step> button. You will see the 'Configure DB connection' screen. Figure 19. Enter the database information including the zabbix password.

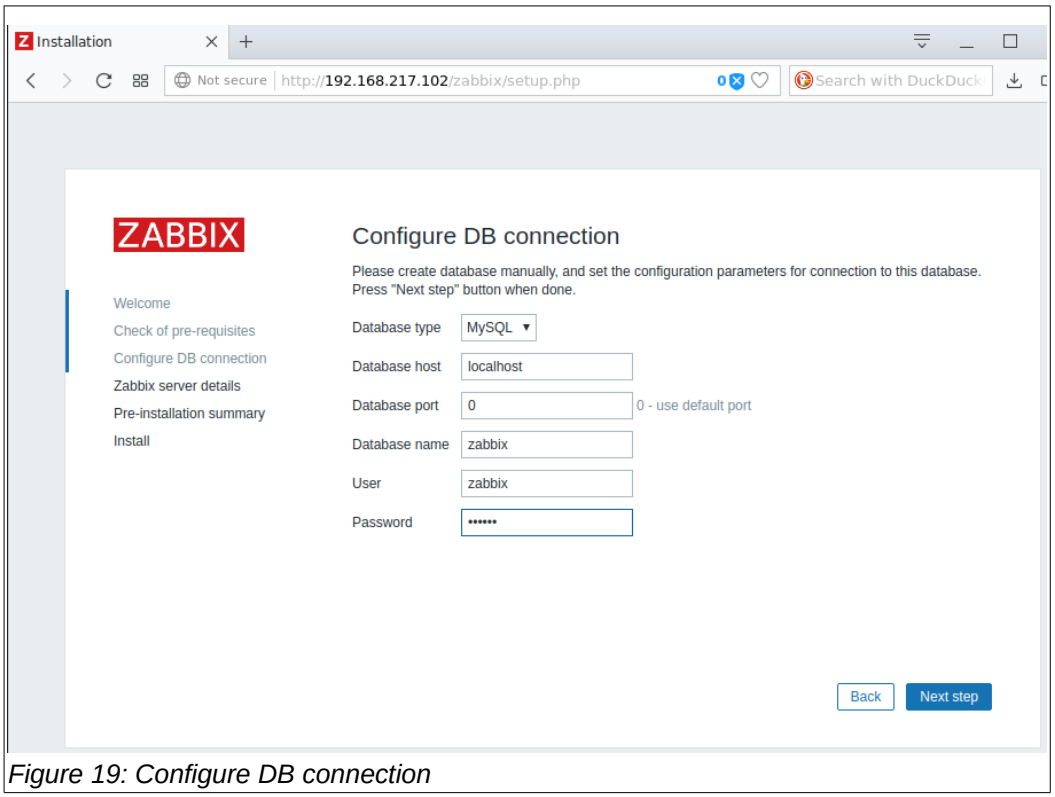

Figure 19: Configure DB connection

Click on the <Next step> button. You will see the 'Zabbix server details' screen. Figure 20.

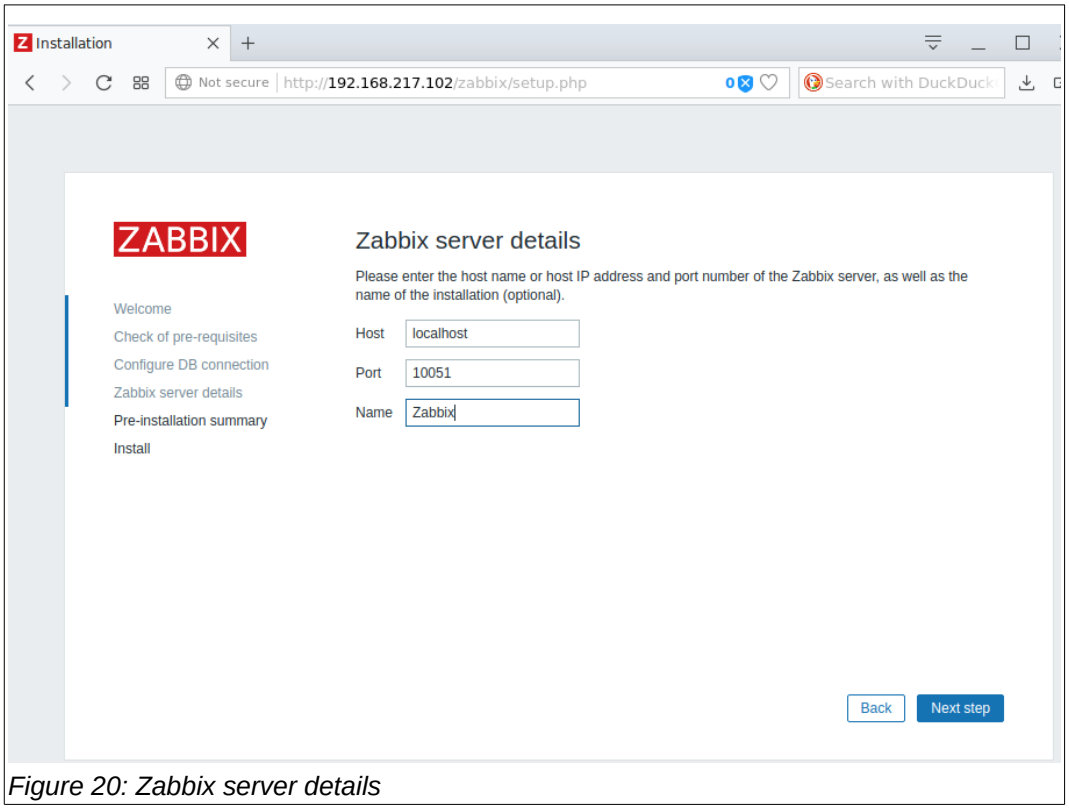

Figure 20: Zabbix server details

Click on the <Next step> button. You will see the ‘Pre-installation summary screen. Figure 21.

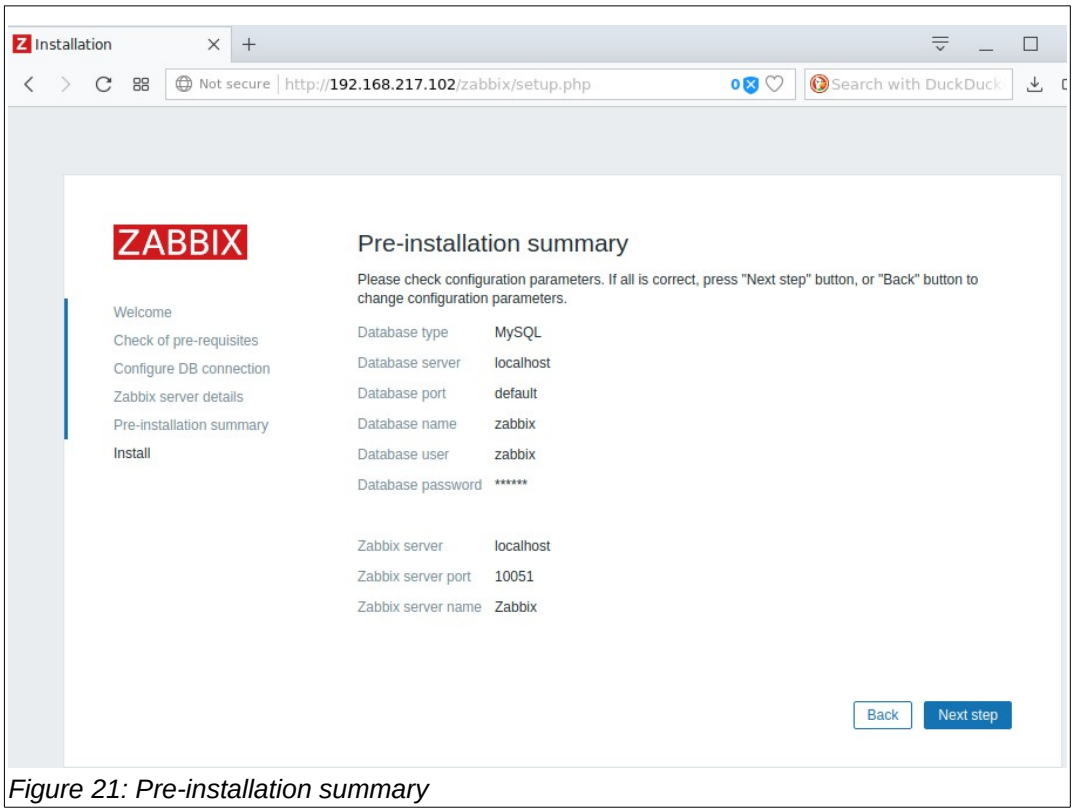

Figure 21: Pre-installation summary

Click on the <Next step> button. You will see the ‘Install’ screen. Figure 22.

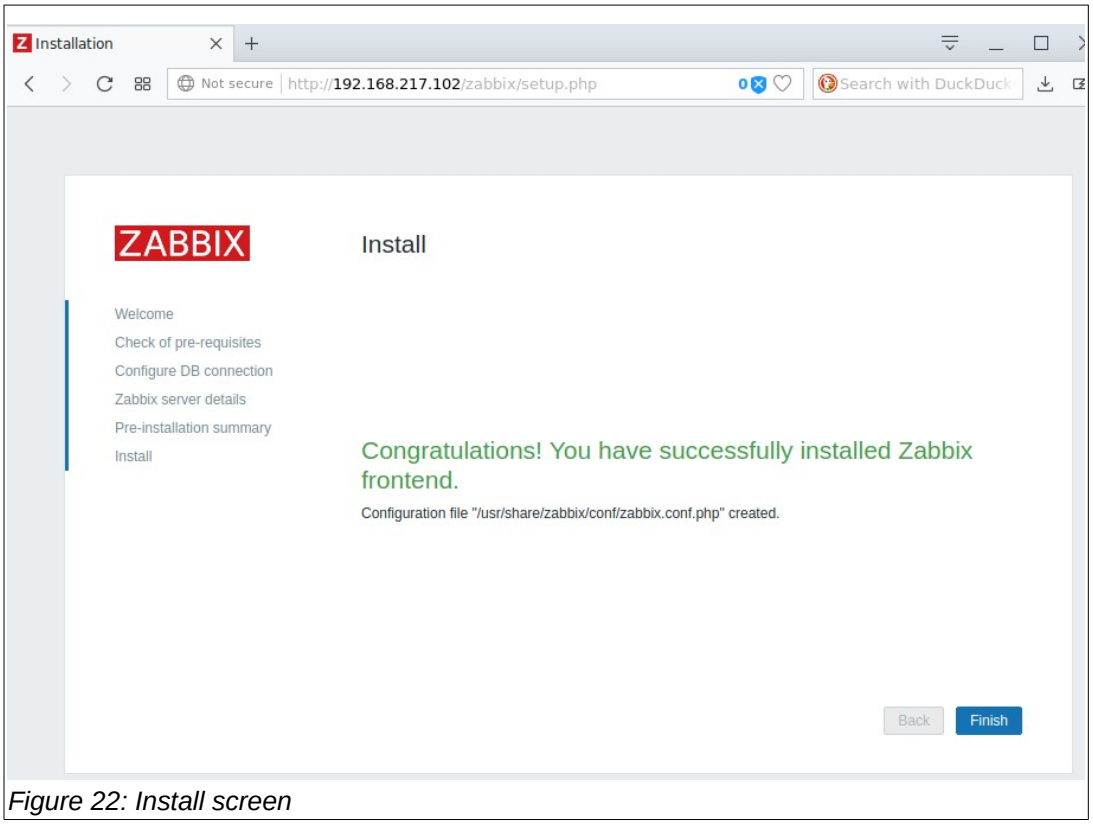

Figure 22: Install screen

This completes the installation of the Zabbix platform components. When you click on the <Finish> button, you will be presented with the Zabbix login prompt. Figure 23.

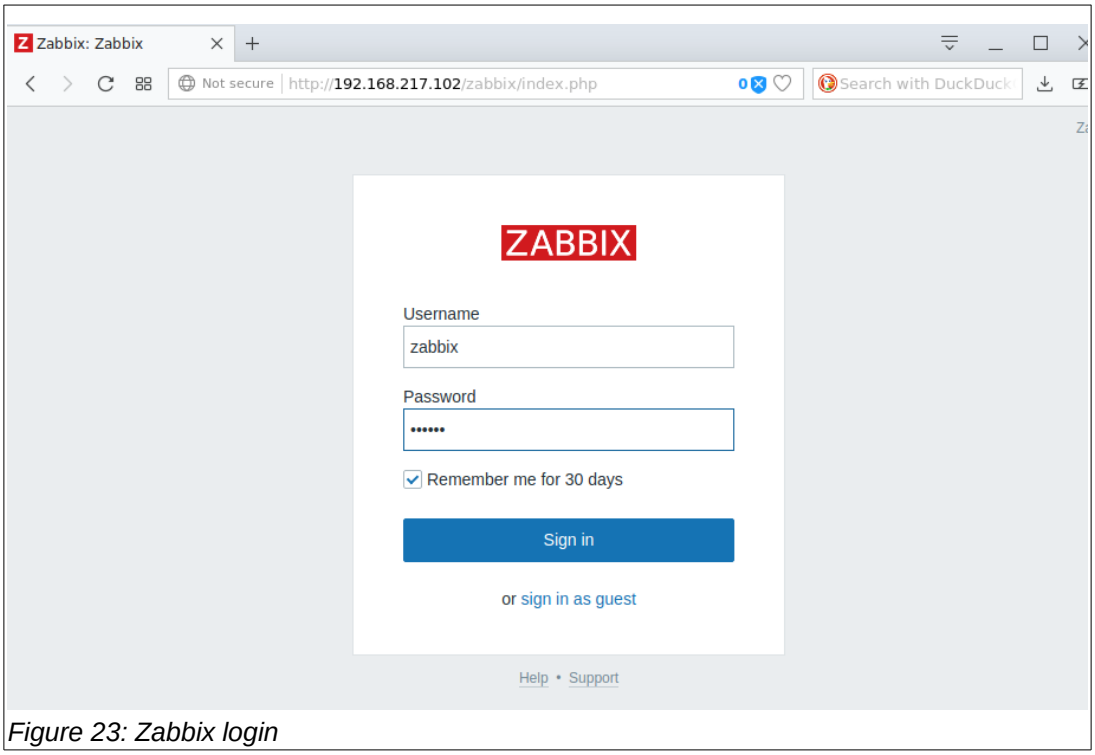

Figure 23: Zabbix login

The default user name is ‘Admin’ and the password is ‘zabbix’.

Once logged in, you will see the ‘Global View’ dashboard. Figure 24.

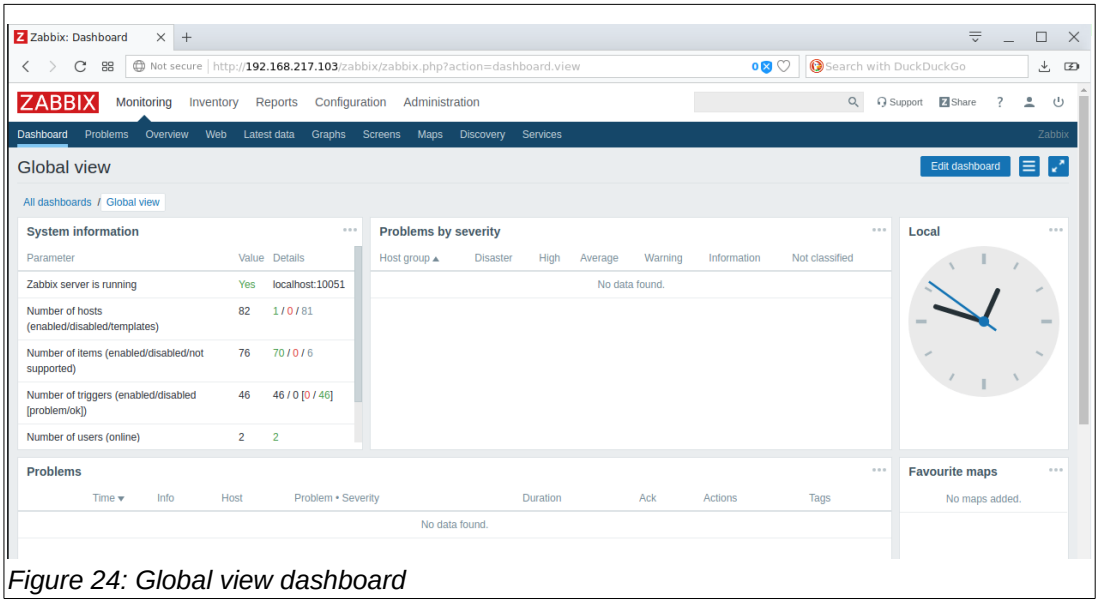

Figure 24: Global view dashboard

Step-8 – Agent installation

The final step is to install an agent on the Server. Zabbix uses its own agent to monitor itself. Very handy.

At a command window type in the below command:

$sudo apt install zabbix-agent.

This is shown in Figure 25.

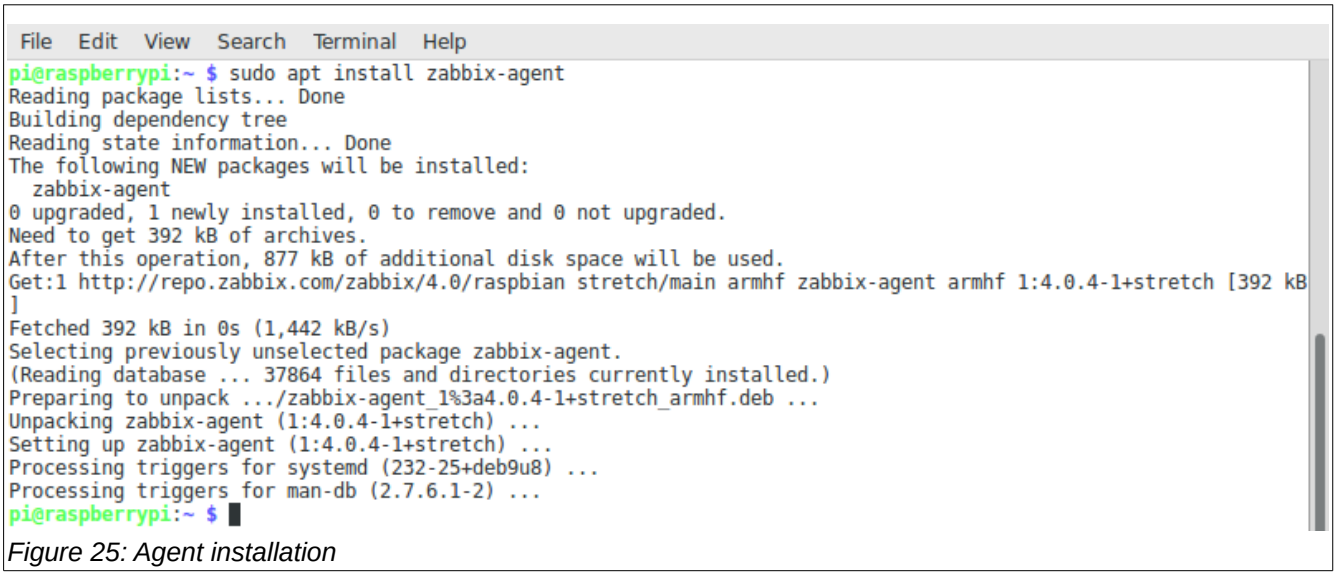

Figure 25: Agent installation

Start the agent by entering the below command:

$sudo service zabbix-agent start

This is shown below in Figure 26.

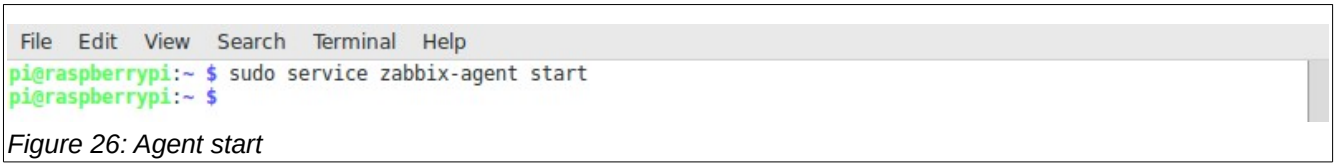

Figure 26: Agent start

Update the rc daemon to start the agent on system startup. Figure 27.

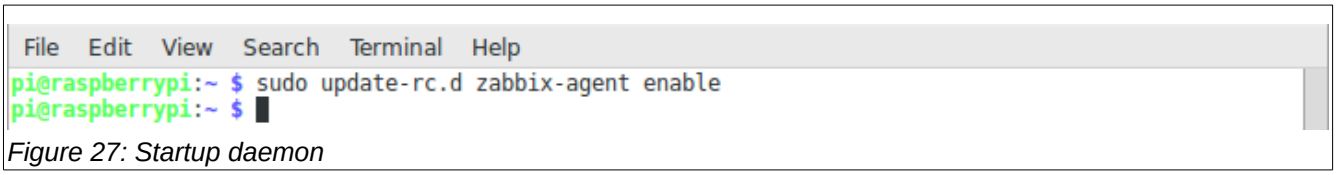

Figure 27: Startup daemon

Congratulations! You now have a working Zabbix server on a Raspberry Pi.

Summary

The Zabbix platform is a terrific open-source project that can be very useful to the Rapspberry Pi community. Upcoming ‘How-To’ documents will show how to monitor the system performance of your active Raspberry Pi’s. As a bonus, I will show how to connect temperature sensors to Zabbix dashboards.

Send corrections, comments, complaints, ideas, or any other feedback to: *sopwith@ismellsmoke.net*.