

Predictive Infrastructure Monitoring Dashboard Using Zabbix



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Project Overview:

The project mainly focuses on implementing a network and system monitoring solution using zabbix, an open-source enterprise monitoring platform. The objective was to deploy a zabbix server in a virtualized environment, configure monitoring for external web resources, and establish host-level monitoring for a Linux system.

The project began with installing Ubuntu Linux on VirtualBox and setting up the zabbix server, front end, and database components. Once the zabbix environment was operational, an external website the University at Albany ualbany.edu was added for availability and performance monitoring. A web scenario was configured to track uptime, response time, and potential service disruptions and created triggers. If the website experiences availability issues, triggers are activated to alert administrators. In the next phase, a zabbix Agent was installed and configured on the Ubuntu Virtual Machine to enable detailed host level monitoring. The host was added inside the zabbix dashboard, and appropriate templates were applied to collect system metrics such as CPU usage, memory consumption, disk space, processes, and network activity.

Through these steps, the project successfully demonstrated the ability to deploy a monitoring infrastructure, observe real-time metrics, generate alerts, and visualize performance data. This foundational setup can be extended to monitor additional servers, services, and network devices in more complex environments.

Keywords: Virtual Box, ubuntu Linux, Zabbix

Project Relevance:

Predictive monitoring plays a critical role in cybersecurity and digital forensics because many incidents begin with detecting anomalies long before a system fully fails. Tools like Zabbix allow people to detect early warning signs such as unexplained CPU spikes, memory exhaustion, slow website response times, unauthorized downtime, or abnormal network traffic that may indicate emerging vulnerabilities. By continuously collecting and storing system data, Zabbix supports real-time visibility as well as forensic reconstruction after an incident occurs.

We chose Zabbix for this project because it is a widely used, open-source monitoring solution that mirrors what real organizations use in system administration and cybersecurity environments. It provides hands-on exposure to concepts that cybersecurity professionals rely on daily, such as alerts, trend analysis, host monitoring, and understanding system health indicators. By monitoring both an external website and a local Ubuntu host, the project demonstrates how to track system health, analyze performance data, and identify unusual behavior that could indicate security issues.

This project helps develop practical skills that are valuable in cybersecurity and digital forensics, including configuring monitoring agents, interpreting system metrics, detecting anomalies, and understanding service availability. These skills are essential for SOC analysts, incident responders, and forensic investigators who rely on accurate system data to identify threats, troubleshooting issues, and prevent outages. Overall, the project demonstrates how proactive monitoring strengthens system reliability, enhances visibility, and contributes to a stronger defensive posture in modern IT environments.

Methodology:

Setup and Environment:

To complete this project, we created a controlled testing environment using VirtualBox. Inside VirtualBox, we installed Ubuntu Linux, which served as the server for running Zabbix. This virtual machine acted as the main monitoring system. we also ensured that the VM had internet access so Zabbix could monitor the UAibany website.

Tools, Frameworks, and Resources:

Tools

VirtualBox: to run the Ubuntu virtual machine

Ubuntu Linux: operating system for installing Zabbix

Zabbix Server: main monitoring tool

Zabbix Frontend – for configuring hosts and viewing dashboard

Zabbix Agent – installed on the Ubuntu VM to collect host performance data

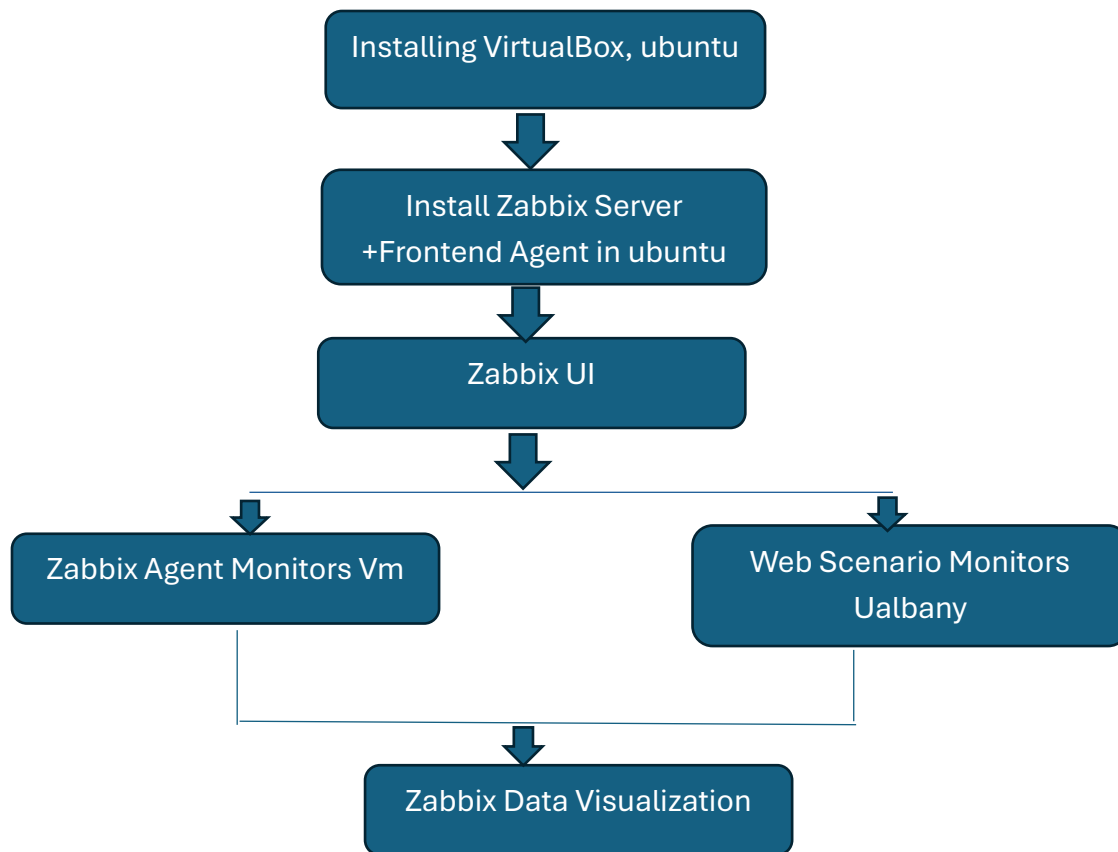
Database: MySQL

Resources Monitored

UAibany Website (ualbany.edu): monitored through HTTP checks

Ubuntu Virtual Machine: monitored through Zabbix Agent.

Workflow:



Summary:

The workflow for this project begins by creating a VirtualBox environment and installing Ubuntu, which serves as the platform for setting up the Zabbix Server and web frontend. After installing and configuring Zabbix, the dashboard is accessed through a browser to manage monitoring activities. A web scenario is added to monitor the UAlbany website by checking its availability and response time, while the Zabbix Agent is installed on the Ubuntu VM to collect system performance data such as CPU, memory, disk, and network usage. Both the website checks and agent data are continuously sent to the Zabbix Server, which processes and stores the information. Finally, the Zabbix dashboard displays all metrics through graphs, alerts, and real-time updates, completing the monitoring workflow.

Step-by-Step Process:

Step 1: Set Up the Virtual Machine

Installed VirtualBox.

Created a new virtual machine and installed Ubuntu.

Updated the system and installed necessary packages.

Step 2: Install Zabbix Server

Installed Zabbix Server, Zabbix Frontend, and Zabbix Agent package from the official repository.

Configured MySQL database for Zabbix.

Started and enabled Zabbix services.

Accessed Zabbix Web UI through browser using VM's IP address.

Step 3: Configure the Zabbix Web Interface

Logged in with default credentials. (username:Admin,password:password)

Set up time zone and frontend settings.

Verified that the Zabbix server was running.

Step 4: Add UAlbany Website for Monitoring

Created a new Web Scenario to monitor <https://www.ualbany.edu>.

Added checks such as:

HTTP status

Response time

Uptime

Applied triggers to alert if the site becomes unavailable.

Step 5: Install and Configure Zabbix Agent on Ubuntu

Installed the Zabbix Agent on the same Ubuntu VM.

Edited the configuration file to point the agent to the Zabbix server.

Started and enabled the agent service.

Step 6: Add Ubuntu as a Host in Zabbix

Added a new host in the Zabbix dashboard.

Linked the template OS Linux by Zabbix Agent.

Verified incoming data such as CPU load, RAM, disk usage, and network traffic.

Step 7: Validate Monitoring Results

Checked graphs, latest data, and dashboards.

Confirmed that both:

- External website monitoring, and Local host monitoring were working correctly

- We added triggers in case the website is unavailable it will trigger the problem so that the appropriate team can handle the situation.

These results show how predictive monitoring improves visibility and incident readiness in real-world cybersecurity environments.

Results:

Zabbix installation:

Prerequisites: **virtual box,ubuntu**

Open the zabbix.com in browser and select the options based on the below screenshot

The screenshot shows the Zabbix download page with a table of supported configurations. The table has six columns: ZABBIX VERSION, OS DISTRIBUTION, OS VERSION, ZABBIX COMPONENT, DATABASE, and WEB SERVER. The first row is highlighted with blue boxes, showing Zabbix 7.4 on Alma Linux 24.04 Noble (amd64, arm64) with the Server, Frontend, and Agent components, using MySQL as the database and Apache as the web server.

ZABBIX VERSION	OS DISTRIBUTION	OS VERSION	ZABBIX COMPONENT	DATABASE	WEB SERVER
7.4	Alma Linux	24.04 Noble (amd64, arm64)	Server, Frontend, Agent	MySQL	Apache
7.2	Amazon Linux			PostgreSQL	Nginx
7.0 LTS	CentOS	22.04 Jammy (amd64, arm64)	Server, Frontend, Agent 2		
6.0 LTS	Debian	20.04 Focal (amd64, arm64)	Proxy		
8.0 PRE-RELEASE	OpenSUSE Leap		Agent		
	Oracle Linux	18.04 Bionic (amd64, i386)	Agent 2		
	Raspberry Pi OS	16.04 Xenial (amd64, i386)	Java Gateway		
	Red Hat Enterprise Linux		Web Service		
	Rocky Linux				
	SUSE Linux Enterprise Server				

Below the table, there is a cookie consent banner with the text: "With your agreement, we and our 4 partners use cookies to store, access, and process personal data. You can withdraw your consent at any time by clicking on 'Learn More' or in our Privacy Policy on this website." There are buttons for "Learn More" and "Agree and close".

Step-1: Updating the ubuntu by using the command :sudo apt update

Step-2: Become root privilege by using command sudo-s

Step-3: install zabbix repositories using the following commands

```
# wget https://repo.zabbix.com/zabbix/7.4/release/ubuntu/pool/main/z/zabbix-release/zabbix-release_latest_7.4+ubuntu24.04_all.deb
# dpkg -i zabbix-release_latest_7.4+ubuntu24.04_all.deb
# apt update
```

```

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

/boxuser@ubuntu:~$ sudo apt update
[sudo] password for vboxuser:
Hit:1 http://us.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:3 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1,620 kB]
Fetched 1,746 kB in 2s (969 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
98 packages can be upgraded. Run 'apt list --upgradable' to see them.
/boxuser@ubuntu:~$ sudo -s
root@ubuntu:/home/vboxuser# ubuntu
ubuntu: command not found
root@ubuntu:/home/vboxuser# wget https://repo.zabbix.com/zabbix/7.4/release/ubuntu/pool/main/z/zabbix-release/zabbix-rel
ease_latest_7.4+ubuntu24.04_all.deb
--2025-11-22 12:46:08-- https://repo.zabbix.com/zabbix/7.4/release/ubuntu/pool/main/z/zabbix-release/zabbix-release_lat
est_7.4+ubuntu24.04_all.deb
Resolving repo.zabbix.com (repo.zabbix.com)... 178.128.6.101, 2604:a880:2:d0::2062:d001
Connecting to repo.zabbix.com (repo.zabbix.com)[178.128.6.101]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 7144 (7.0K) [application/octet-stream]
Saving to: 'zabbix-release_latest_7.4+ubuntu24.04_all.deb'

zabbix-release_latest_7.4+ubu 100%[=====] 6.98K --.-KB/s in 0s

2025-11-22 12:46:09 (413 MB/s) - 'zabbix-release_latest_7.4+ubuntu24.04_all.deb' saved [7144/7144]

root@ubuntu:/home/vboxuser# dpkg -i zabbix-release_latest_7.4+ubuntu24.04_all.deb

```

Step-4: Install Zabbix server, frontend, agent by running the following command

```
# apt install zabbix-server-mysql zabbix-frontend-php zabbix-apache-conf zabbix-sql-scripts zabbix-agent
```

```

Nov 22 13:57
root@ubuntu:/home/vboxuser
root@ubuntu:/home/vboxuser# dpkg -i zabbix-release_latest_7.4+ubuntu24.04_all.deb
Selecting previously unselected package zabbix-release.
(Reading database ... 150416 files and directories currently installed.)
Preparing to unpack zabbix-release_latest_7.4+ubuntu24.04_all.deb ...
Unpacking zabbix-release (1:7.4-1+ubuntu24.04) ...
Setting up zabbix-release (1:7.4-1+ubuntu24.04) ...
root@ubuntu:/home/vboxuser# apt update
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://us.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://us.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:5 https://repo.zabbix.com/zabbix/7.4/release/ubuntu noble InRelease [2,459 B]
Get:6 https://repo.zabbix.com/zabbix-tools/debian-ubuntu noble InRelease [2,476 B]
Get:7 https://repo.zabbix.com/zabbix/7.4/stable/ubuntu noble InRelease [4,681 B]
Get:8 https://repo.zabbix.com/zabbix/7.4/release/ubuntu noble/main Sources [942 B]
Get:9 https://repo.zabbix.com/zabbix/7.4/release/ubuntu noble/main all Packages [632 B]
Get:10 https://repo.zabbix.com/zabbix-tools/debian-ubuntu noble/main Sources [1,367 B]
Get:11 https://repo.zabbix.com/zabbix-tools/debian-ubuntu noble/main all Packages [866 B]
Get:12 https://repo.zabbix.com/zabbix/7.4/stable/ubuntu noble/main Sources [12.6 kB]
Get:13 https://repo.zabbix.com/zabbix/7.4/stable/ubuntu noble/main all Packages [5,072 B]
Get:14 https://repo.zabbix.com/zabbix/7.4/stable/ubuntu noble/main amd64 Packages [25.7 kB]
Fetched 56.8 kB in 2s (25.2 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
98 packages can be upgraded. Run 'apt list --upgradable' to see them.
root@ubuntu:/home/vboxuser# apt install zabbix-server-mysql zabbix-frontend-php zabbix-apache-conf zabbix-sql-scripts za
bbix-agent
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils fonts-dejavu fonts-dejavu-extra fontconfig libapache2-mod-php

```

Step-5:Installing mysql by using the command sudo apt install mysql-server

```
root@ubuntu:/home/vboxuser# sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libaio1t64 libcgi-fast-perl libcgi-pm-perl libfcgi-bin libfcgi-perl libfcgi0t64 libhtml-template-perl libmecab2
  libprotobuf-lite32t64 mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
  libipc-sharedcache-perl mailx tinycd
The following NEW packages will be installed:
  libaio1t64 libcgi-fast-perl libcgi-pm-perl libfcgi-bin libfcgi-perl libfcgi0t64 libhtml-template-perl libmecab2
  libprotobuf-lite32t64 mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-server mysql-server-8.0 mysql-server-core-8.0
0 upgraded, 15 newly installed, 0 to remove and 98 not upgraded.
Need to get 26.5 MB of archives.
After this operation, 180 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 libaio1t64 amd64 0.3.113-6build1.1 [7,210 B]
Get:2 http://us.archive.ubuntu.com/ubuntu noble/main amd64 libmecab2 amd64 0.996-14ubuntu4 [201 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 libprotobuf-lite32t64 amd64 3.21.12-8.2ubuntu0.2 [238
kB]
Get:4 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-server-core-8.0 amd64 8.0.44-0ubuntu0.24.04.1 [
17.5 MB]
Get:5 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-server-8.0 amd64 8.0.44-0ubuntu0.24.04.1 [1,441
kB]
Get:6 http://us.archive.ubuntu.com/ubuntu noble/main amd64 libcgi-pm-perl all 4.63-1 [185 kB]
Get:7 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 libfcgi0t64 amd64 2.4.2-2.1ubuntu0.24.04.1 [27.0 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu noble/main amd64 libfcgi-perl amd64 0.82+ds-3build2 [21.7 kB]
Get:9 http://us.archive.ubuntu.com/ubuntu noble/main amd64 libcgi-fast-perl all 1:2.17-1 [10.3 kB]
Get:10 http://us.archive.ubuntu.com/ubuntu noble-updates/main amd64 libfcgi-bin amd64 2.4.2-2.1ubuntu0.24.04.1 [11.2 kB]
Get:11 http://us.archive.ubuntu.com/ubuntu noble/main amd64 libhtml-template-perl all 2.97-2 [60.2 kB]
Get:12 http://us.archive.ubuntu.com/ubuntu noble/main amd64 mecab-utils amd64 0.996-14ubuntu4 [4,804 B]
Get:13 http://us.archive.ubuntu.com/ubuntu noble/main amd64 mecab-ipadic all 2.7.0-20070801+main-3 [6,718 kB]
Get:14 http://us.archive.ubuntu.com/ubuntu noble/main amd64 mecab-ipadic-utf8 all 2.7.0-20070801+main-3 [4,384 B]
```

Step-6:starting the mysql service using the command :service mysql start

```
root@ubuntu:/home/vboxuser# service mysql start
root@ubuntu:/home/vboxuser# mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.44-0ubuntu0.24.04.1 (Ubuntu)

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

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

mysql> create database zabbix character set utf8mb4 collate utf8mb4_bin;
Query OK, 1 row affected (0.03 sec)

mysql> create user zabbix@localhost identified by 'password';
Query OK, 0 rows affected (0.04 sec)

mysql> grant all privileges on zabbix.* to zabbix@localhost;
Query OK, 0 rows affected (0.03 sec)

mysql> set global log_bin_trust_function_creators = 1;
Query OK, 0 rows affected, 1 warning (0.00 sec)

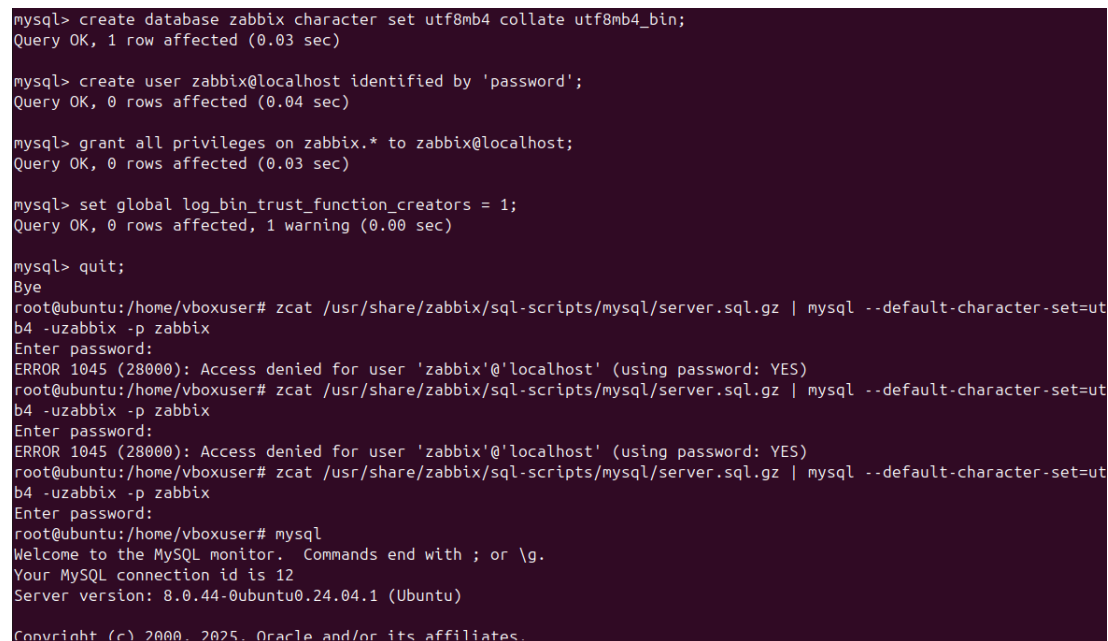
mysql> quit;
Bye
root@ubuntu:/home/vboxuser# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8m
b4 -uzabbix -p zabbix
Enter password:
ERROR 1045 (28000): Access denied for user 'zabbix'@'localhost' (using password: YES)
root@ubuntu:/home/vboxuser# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8m
```

Step-7: Create initial database

```
mysql> create database zabbix character set utf8mb4 collate utf8mb4_bin;
mysql> create user zabbix@localhost identified by 'password';
mysql> grant all privileges on zabbix.* to zabbix@localhost;
mysql> set global log_bin_trust_function_creators = 1;
mysql> quit;
```

Step-8: On Zabbix server host import initial schema and data. You will be prompted to enter your newly created password.(password=password)

```
# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8mb4 -uzabbix -p zabbix
```



```
mysql> create database zabbix character set utf8mb4 collate utf8mb4_bin;
Query OK, 1 row affected (0.03 sec)

mysql> create user zabbix@localhost identified by 'password';
Query OK, 0 rows affected (0.04 sec)

mysql> grant all privileges on zabbix.* to zabbix@localhost;
Query OK, 0 rows affected (0.03 sec)

mysql> set global log_bin_trust_function_creators = 1;
Query OK, 0 rows affected, 1 warning (0.00 sec)

mysql> quit;
Bye
root@ubuntu:/home/vboxuser# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8mb4 -uzabbix -p zabbix
Enter password:
ERROR 1045 (28000): Access denied for user 'zabbix'@'localhost' (using password: YES)
root@ubuntu:/home/vboxuser# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8mb4 -uzabbix -p zabbix
Enter password:
ERROR 1045 (28000): Access denied for user 'zabbix'@'localhost' (using password: YES)
root@ubuntu:/home/vboxuser# zcat /usr/share/zabbix/sql-scripts/mysql/server.sql.gz | mysql --default-character-set=utf8mb4 -uzabbix -p zabbix
Enter password:
root@ubuntu:/home/vboxuser# mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 12
Server version: 8.0.44-0ubuntu0.24.04.1 (Ubuntu)

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```

Step-9: Edit file /etc/zabbix/zabbix_server.conf using the command sudo nano /etc/zabbix/zabbix_server.conf

Change password=password as shown in below screenshot

Step-10:

Start Zabbix server and agent processes

Start Zabbix server and agent processes and make it start at system boot.

```
# systemctl restart zabbix-server zabbix-agent apache2
```

```
# systemctl enable zabbix-server zabbix-agent apache2
```

```

root@ubuntu:/home/vboxuser# vi /etc/zabbix/zabbix_server.conf
root@ubuntu:/home/vboxuser# sudo nano /etc/zabbix/zabbix_server.conf
root@ubuntu:/home/vboxuser# systemctl restart zabbix-server zabbix-agent apache2
root@ubuntu:/home/vboxuser# systemctl enable zabbix-server zabbix-agent apache2
Synchronizing state of zabbix-server.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable zabbix-server
Synchronizing state of zabbix-agent.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable zabbix-agent
Synchronizing state of apache2.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable apache2
Created symlink /etc/systemd/system/multi-user.target.wants/zabbix-server.service → /usr/lib/systemd/system/zabbix-server.service.
root@ubuntu:/home/vboxuser# sudo systemctl status zabbix-server.service
● zabbix-server.service - Zabbix Server
   Loaded: loaded (/usr/lib/systemd/system/zabbix-server.service; enabled; preset: enabled)
   Active: active (running) since Sat 2025-11-22 13:41:49 UTC; 2min 25s ago
     Main PID: 23673 (zabbix_server)
        Tasks: 77 (limit: 6901)
      Memory: 62.3M (peak: 62.8M)
         CPU: 1.476s
       CGroup: /system.slice/zabbix-server.service
               └─23673 /usr/sbin/zabbix_server -c /etc/zabbix/zabbix_server.conf
                 23704 "/usr/sbin/zabbix_server --manager"

```

```

# Mandatory: no
# Default:C
DBPassword=password
### Option: DBSocket
# Path to MySQL socket.
#
# Mandatory: no
# Default:
# DBSocket=

### Option: DBPort
# Database port when not using local socket.
#
# Mandatory: no
# Range: 1024-65535
# Default for MySQL: 3306
# Default for PostgreSQL: 5432
# DBPort=

### Option: AllowUnsupportedDBVersions
# Allow server to work with unsupported database versions.
# 0 - do not allow
# 1 - allow
#
# Mandatory: no
# Default:
# AllowUnsupportedDBVersions=0

```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark
 ^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^_ Go To Line M-E Redo M-G Copy

```

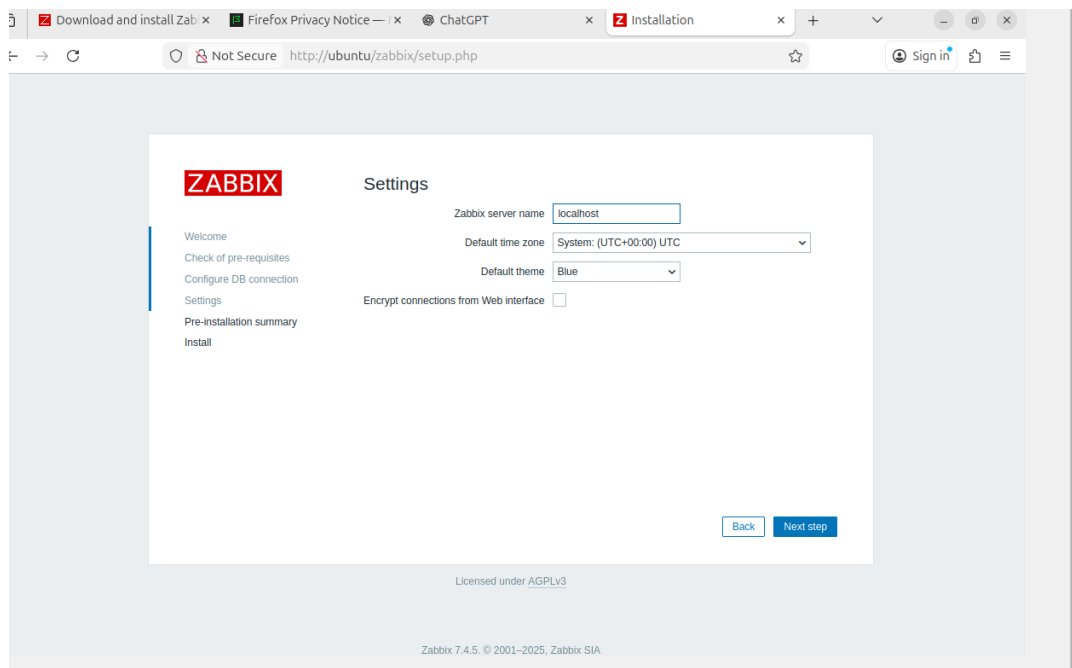
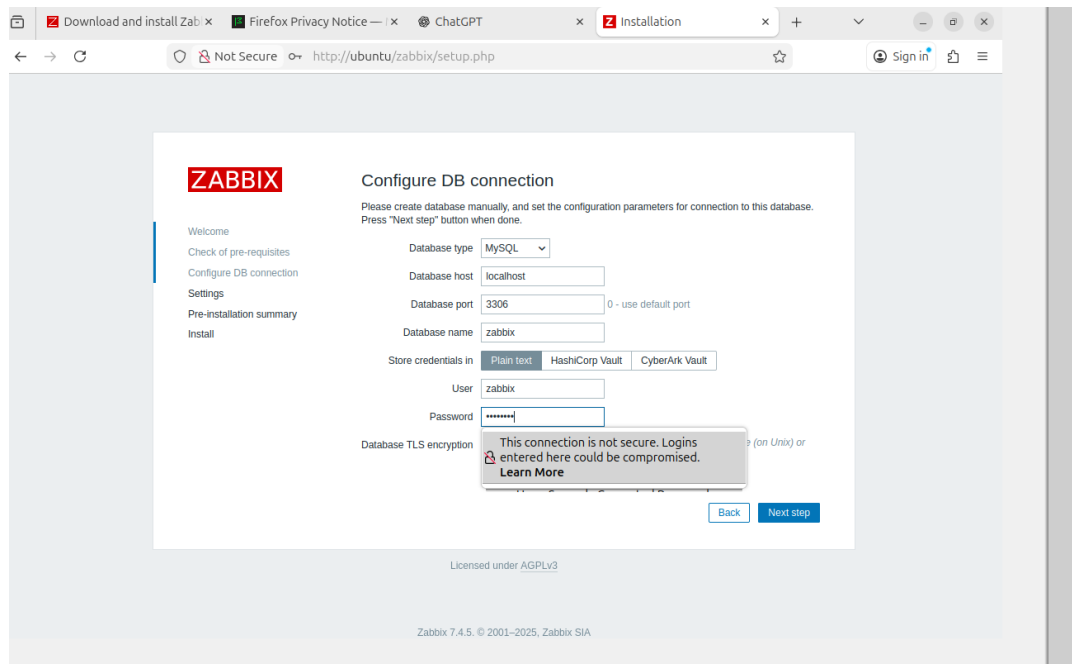
root@ubuntu:/home/vboxuser# hostname
ubuntu
root@ubuntu:/home/vboxuser# hostname

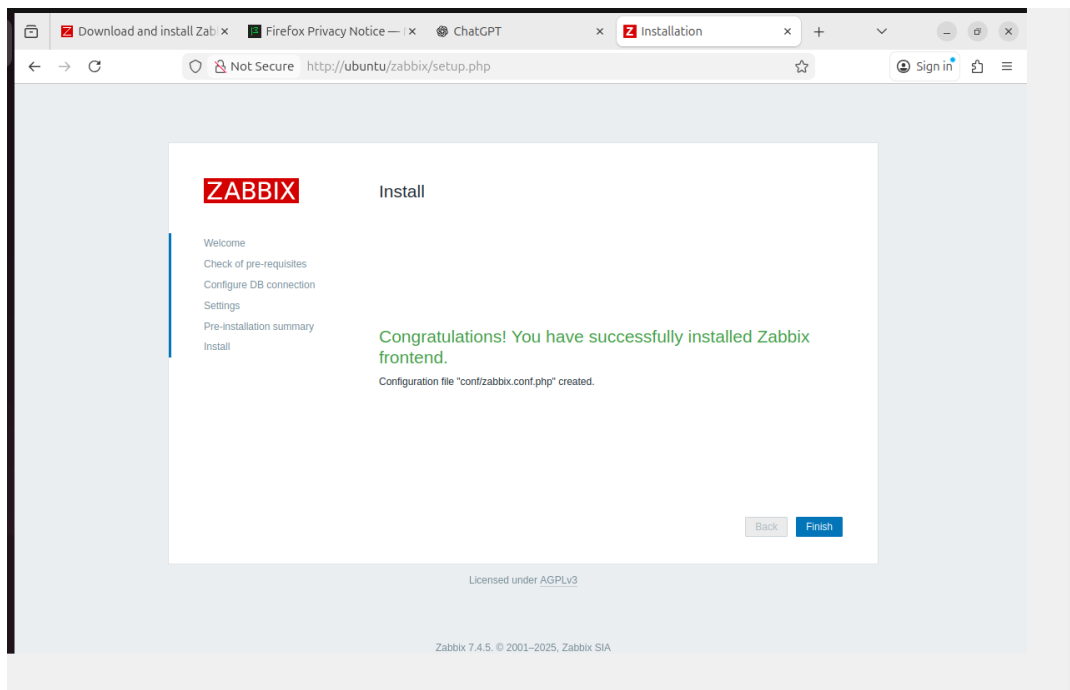
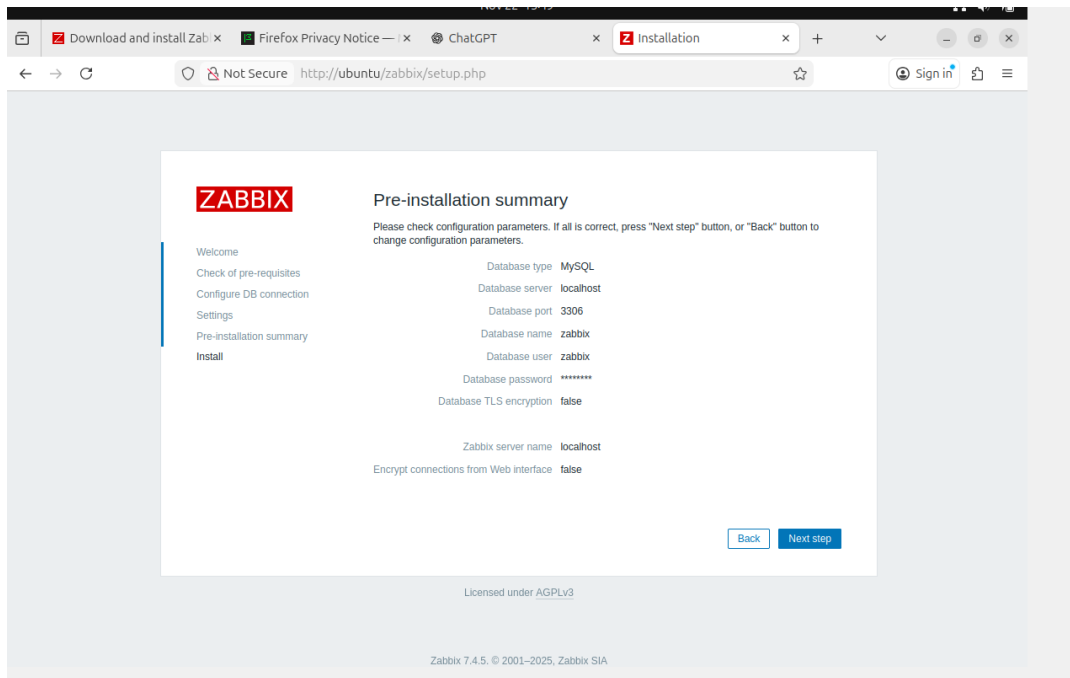
```

Step-11:

Open Zabbix UI web page

The default URL for Zabbix UI when using Apache web server is <http://host/zabbix>

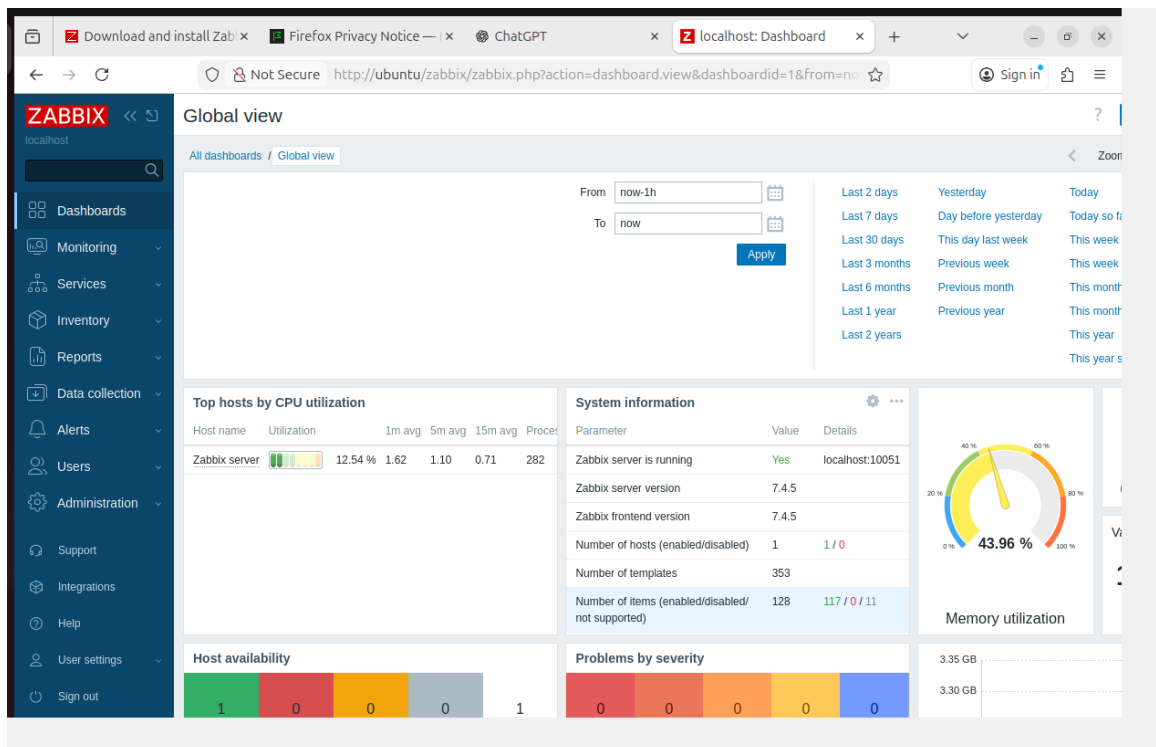
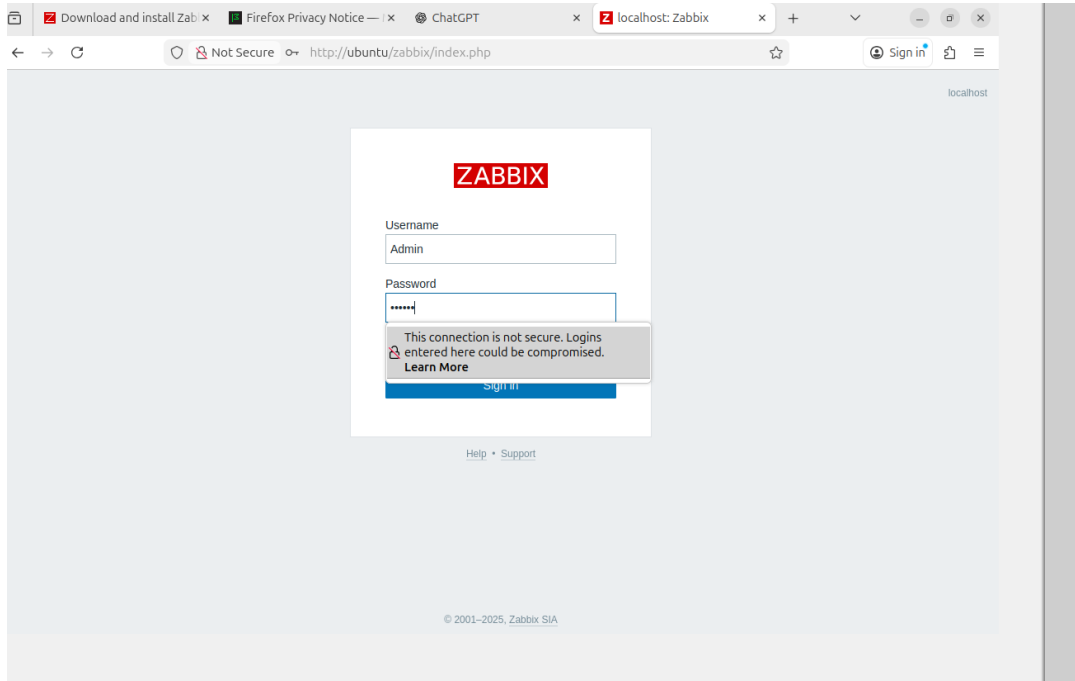




Login to Zabbix using

Username: Admin

Password: password



Monitoring web using Zabbix:

Step-1: Adding website to monitor

Select Data Collection=>Hosts=>web=>select create web scenario and add the websites wants to monitor

Step-2: select monitoring=>latest data=>select host Zabbix-server=>where you can observe the response code(200)

The screenshot displays the Zabbix web interface at the 'Hosts' configuration page. The browser address bar shows the URL `http://ubuntu/zabbix/zabbix.php?action=host.list`. The sidebar on the left contains navigation links for various Zabbix components. The main area features a form to create or edit a host, with fields for 'Host groups', 'Templates', 'Name', 'DNS', 'IP', and 'Port'. There are also filters for 'Status' (Any, Enabled, Disabled), 'Monitored by' (Any, Server, Proxy, Proxy group), and 'Tags'. Below the form is a table of existing hosts. The table has columns for 'Name', 'Items', 'Triggers', 'Graphs', 'Discovery', 'Web', 'Interface', 'Proxy', 'Templates', 'Status', and 'Availability'. One host is listed: 'Zabbix server' with 146 items, 78 triggers, 14 graphs, 6 discovery scripts, and 2 web items. The status is 'Enabled' and the availability is 'ZBX'. At the bottom, there are buttons for 'Apply' and 'Reset'.

Name	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability
Zabbix server	146	78	14	6	2	127.0.0.1:10050		Linux by Zabbix agent, Zabbix server health	Enabled	ZBX

Nov 23 13:34

Download and insta x Firefox Privacy Noti x ChatGPT x localhost: Configure x localhost: Dashboar x

Not Secure http://ubuntu/zabbix/httpconf.php?filter_set=1&filter_hostids[0]=10084&context=

Sign in

ZABBIX

localhost

enabled 28% Items 146 Triggers 78 Graphs 14 Discovery rules 6 Web scenarios 2

Filter

type here to search

Select

Tags And/Or Or

tag

Contains

value

Remove

Add

All Enabled Disabled

Apply Reset

	Number of steps	Interval	Attempts	Authentication	HTTP proxy	Status	Tags	Info
	1	30s	1	None	No	Enabled		
	1	30s	1	None	No	Enabled		

Displaying 2 of 2 found

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Nov 23 13:36

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Not Secure http://ubuntu/zabbix/zabbix.php?name=&evaltype=0&tags[0][tag]=&tags[0][operat]

Sign in

ZABBIX

localhost

Subfilter affects only filtered data

Name

Show tags None 1 2 3 Tag name Full Shortened None

Tag display priority comma-separated list

State All Normal Not supported

Show details

Save as Apply Reset

HOSTS

Zabbix server 158

TAGS

component 146 disk 8 filesystem 7 fstype 7 interface 9

TAG VALUES

component: application 1 cpu 17 environment 1 gathering-process 16 internal-process 27 memory 7 network 9 nvps 8 os 3 raw 7 security 1 storage 18 system 43

disk: sda 8

filesystem: / 7

fstype: ext4 7

interface: enp0s3 9

STATE

Normal 146 Not supported 12

DATA

With data Without data

	Host	Name	Last check	Last value	Change	Tags
	Zabbix server	Available memory	14s	3.09 GB	+380 KB	component: memory
	Zabbix server	Available memory in %	13s	54.2486 %	+0.003684 %	component: memory

	Zabbix server	Queue	7s	0	component: system
	Zabbix server	Queue over 10 minutes	8s	0	component: system
	Zabbix server	Response code for step "Google.com" of scenario "Goo...	27s	200	
	Zabbix server	Response code for step "https://www.albany.edu/" of sce...	28s	200	

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Not Secure http://ubuntu/zabbix/zabbix.php?action=trigger.list&filter_set=1&filter_hostids: Sign in

ZABBIX

localhost

Create trigger

New trigger

Trigger Tags Dependence

* Item Zabbix server: Response code for step "https://www.albany.edu/" of scenario "https: Select

Function last() - Last (most recent) T value

Last of (T) 2 Count

Time shift now-h Time

* Result <> 200

Insert Cancel

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

Allow manual close

Add Cancel

last(Zabbix server/kernel.maxfiles)<{\$KERNEL.MAXFILES.MIN} Enabled scope: performance

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Not Secure http://ubuntu/zabbix/zabbix.php?action=trigger.list&filter_set=1&filter_hostids: Sign in

ZABBIX

localhost

Create trigger

New trigger

Trigger Tags Dependence

* Item Zabbix server: Response code for step "https://www.albany.edu/" of scenario "https: Select

Function last() - Last (most recent) T value

Last of (T) 1 Count

Time shift now-h Time

* Result = 200

Insert Cancel

Expression constructor

OK event generation Expression Recovery expression None

* Recovery expression Add

PROBLEM event generation mode Single Multiple

OK event closes All problems All problems if tag values match

Add Cancel

last(Zabbix server/kernel.maxfiles)<{\$KERNEL.MAXFILES.MIN} Enabled scope: performance

Download and insta x Firefox Privacy Noti x ChatGPT x localhost: Configur x localhost: Dashboar x

Not Secure http://ubuntu/zabbix/zabbix.php?action=trigger.list&filter_set=1&filter_hostids= Sign in

ZABBIX

localhost

Create trigger

New trigger

Trigger Tags Dependencies

Name:

Event name:

Operational data:

Severity: ☐ Not classified ☐ Information ☐ Warning ☒ Average ☐ High ☐ Disaster

Problem expression: Add

Expression constructor

OK event generation: ☐ Expression ☒ Recovery expression ☐ None

Recovery expression: Add

Add Cancel

...m name has changed

...by Zabbix agent: Linux

...figured max number

last(/Zabbix server/kernel.maxfiles)<={\$KERNEL.MAXFILES.MIN}

Enabled scope: performance

avascript:void(0)

ZABBIX

localhost

Web monitoring

Step of web scenario

Name:

URL: Parse

Query fields

Name	Value
name	value

Add Remove

Post type: ☒ Form data ☐ Raw data

Post fields

Name	Value
name	value

Add Remove

Variables

Name	Value
name	value

Add Remove

Headers

Name	Value
name	value

Add Remove

Update Cancel

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ZABBIX

localhost

Dashboards Monitoring Services Inventory Reports Data collection Template groups Host groups Templates Hosts Maintenance Event correlation Discovery Alerts Users Administration

Triggers

All hosts / Zabbix server Enabled ZBX Items 146 Triggers 79 Graphs 14 Discovery rules 6 Web scenarios 1

Host groups type here to search Select

Hosts Zabbix server X type here to search Select

Name

Severity ☐ Not classified ☐ Warning ☐ High ☐ Information ☐ Average ☐ Disaster

State All Normal Unknown

Status All Enabled Disabled

Value All Ok Problem

Tags And/Or Or tag Contains value Add

Inherited All Yes No

Discovered All Yes No

With dependencies All Yes No

Apply Reset

Severity	Value	Name	Operational data	Expression	Status
<input type="checkbox"/> High	PROBLEM	https://www.albany.edu/		Problem: <code>last(/Zabbix server/web.test.rspcode[https://www.albany.edu/https://www.albany.edu/],#2)<=200</code> Recovery: <code>last(/Zabbix server/web.test.rspcode[https://www.albany.edu/https://www.albany.edu/],#1)=200</code>	Enabled
<input type="checkbox"/> Information	OK	Linux by Zabbix agent: Linux: /etc/passwd has been changed Depends on: Zabbix server: Linux: Operating system description has changed		<code>last(/Zabbix server/vfs.file.cksum[/etc/passwd,sha256],#1)<=last(/Zabbix server/vfs.file.cksum[/etc/passwd,sha256],#2)</code>	Enabled

Creating ubuntu host

ABBIX localhost

Host Wizard Create host Import

New host

Host IPMI Tags Macros Inventory Encryption Value mapping

* Host name ubuntu

Visible name ubuntu

Templates Linux by Zabbix agent X type here to search Select

* Host groups Linux servers X type here to search Select

Interfaces	Type	IP address	DNS name	Connect to	Port	Default
Agent	127.0.0.1		IP	DNS	10050	<input checked="" type="radio"/> Remove

Add

Description

Monitored by ☒ Server ☐ Proxy ☐ Proxy group

Add Cancel

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Not Secure http://ubuntu/zabbix/zabbix.php?action=host.list Sign in

ZABBIX

localhost

- Dashboards
- Monitoring
- Services
- Inventory
- Reports
- Data collection
 - Template groups
 - Host groups
 - Templates
 - Hosts
 - Maintenance
 - Event correlation
 - Discovery
- Alerts
- Users
- Administration

Hosts

Host groups type here to search Select Status Any Enabled Disabled

Templates type here to search Select Monitored by Any Server Proxy Proxy group

Tags And/Or Or tag Contains value Add

Name DNS IP Port

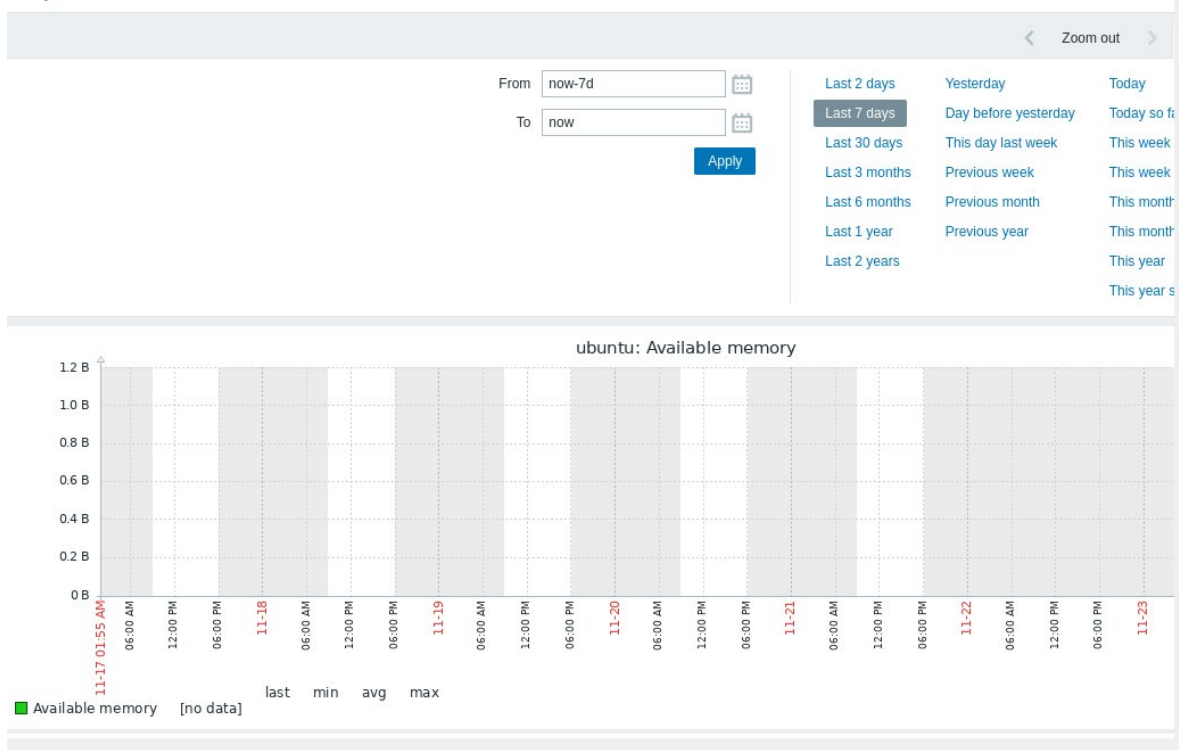
Apply Reset

	Name	Items	Triggers	Graphs	Discovery	Web	Interface	Proxy	Templates	Status	Availability
<input type="checkbox"/>	... ubuntu	Items 68	Triggers 25	Graphs 14	Discovery 3	Web	127.0.0.1:10050		Linux by Zabbix agent	Enabled	ZBX
<input type="checkbox"/>	... Zabbix server	Items 146	Triggers 79	Graphs 14	Discovery 6	Web 2	127.0.0.1:10050		Linux by Zabbix agent, Zabbix server health	Enabled	ZBX

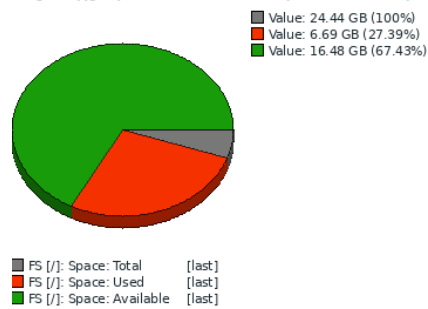
0 selected Enable Disable Export Mass update Delete

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Graphs

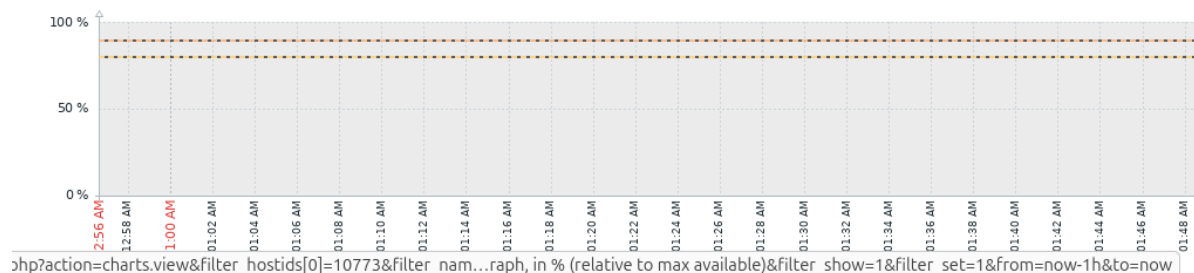


FS [ext4(/)]: Space utilization chart (relative to total)



FS [{#FSTYPE}]{#FSNAME}): Space usage graph, in % (relative to max available)

FS [ext4(/)]: Space usage graph, in % (relative to max available)



Conclusion:

In this project, Zabbix was successfully installed and configured on an Ubuntu virtual machine to monitor both an external website and a local system. By setting up web monitoring for the UAlbany website and deploying the Zabbix Agent on the Ubuntu host, the project demonstrated how real-time system data, performance metrics, and availability checks can be collected and analyzed through a centralized dashboard. This hands-on experience showed how monitoring tools play a vital role in cybersecurity by helping detect problems early, identify unusual activity, and maintain system reliability.

Future enhancements can include fully implementing email alerting, monitoring multiple hosts, and applying anomaly detection models for predictive risk analysis. Overall, the project provided valuable practical skills in Linux administration, system monitoring, and the use of open-source tools that are essential for cybersecurity and digital forensics work.