

Zabbix Monitoring PFsense using Agent

Would you like to learn how to do monitor PFsense using Zabbix? In this tutorial, we are going to show you how to install and configure the Zabbix agent software on a computer running PFsense and how to monitor a PFsense firewall using the Zabbix server.

Hardware List:

- Zabbix server 4.2.6 with IP address: 192.168.15.10
- PfSense 2.4.4-p3 with IP address: 192.168.15.11

PfSense - Zabbix Agent Installation

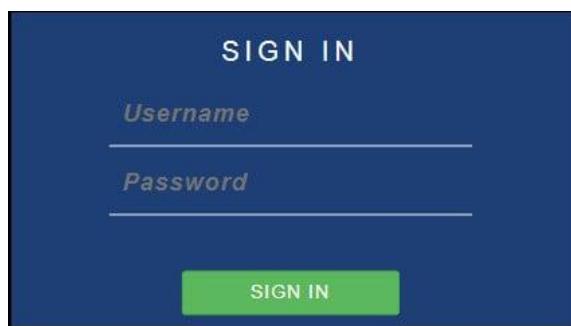
First, we need to install the Zabbix agent on the PfSense server.

Open a browser software, enter the IP address of your PfSense firewall and access web interface.

In our example, the following URL was entered in the Browser:

- <https://192.168.15.11>

The PfSense web interface should be presented.



On the prompt screen, enter the PfSense Default Password login information.

- Username: admin
- Password: pfSense

After a successful login, you will be sent to the PfSense Dashboard.

The screenshot shows the PfSense Community Edition dashboard. The top navigation bar includes links for System, Interfaces, Firewall, Services, VPN, Status, Diagnostics, and Help. The main content area has two main sections: 'System Information' and 'Netgate Services And Support'. The 'System Information' section displays details such as Name (firewall.techexpert.tips), User (admin@192.168.15.9), System (VirtualBox Virtual Machine, Netgate Device ID: 98b7aa49047384d25c9d), BIOS (Vendor: innotek GmbH, Version: VirtualBox, Release Date: Fri Dec 1 2006), and Version (2.4.4-RELEASE-p3). It also indicates that the system is on the latest version and provides a link to update information. The 'Netgate Services And Support' section shows that the contract type is 'Community Support' with 'Community Support Only'. It also links to 'NETGATE AND pfSense COMMUNITY SUPPORT RESOURCES' and provides information about purchasing support from Netgate.

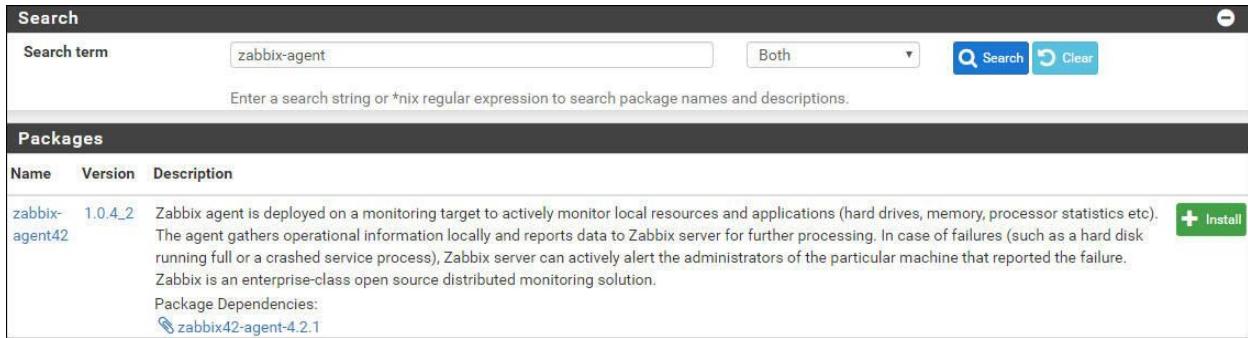
Access the PfSense System menu and select the Package Manager option.



On the package manager screen, access the Available packages tab.

On the Available packages tab, search for zabbix-agent and install the Zabbix agent package.

There are multiple agent versions available, make sure you select the same version of your Zabbix server.



The screenshot shows a search interface for packages. The search term is "zabbix-agent". The results table has columns for Name, Version, and Description. One result is shown: "zabbix-agent42" version "1.0.4_2". The description states: "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 is an enterprise-class open source distributed monitoring solution." Below the description, it says "Package Dependencies: zabbix42-agent-4.2.1". There is a green "Install" button next to the package entry.

In our example, we have a Zabbix server version 4.2.6.

In our example, we installed the Zabbix agent package named: zabbix-agent42

Wait the Zabbix agent installation to finish.

Access the Pfsense Services menu and select the Zabbix Agent option.



On the General tab, enable the Zabbix agent service and perform the following configuration:

- Server - The IP address of the Zabbix server
- ServerActive - The IP address of the Zabbix server
- Hostname - The hostname of the PFsense firewall
- Listen IP - Use 0.0.0.0 to listen on All IP addresses
- Listen Port - Zabbix agent default port 10050

Zabbix Agent Settings

Enable	<input checked="" type="checkbox"/> Enable Zabbix Agent service.
Server	192.168.15.10 List of comma delimited IP addresses (or hostnames) of ZABBIX servers.
Server Active	192.168.15.10 List of comma delimited IP:port (or hostname:port) pairs of Zabbix servers
Hostname	PFSENSE-FIREWALL Unique, case sensitive hostname. Required for active checks and must match the interface name.
Listen IP	0.0.0.0 Listen IP for connections from the server. (Default: 0.0.0.0 - all interfaces)
Listen Port	10050 Listen port for connections from the server. (Default: 10050)
Refresh Active Checks	120 The agent will refresh list of active checks once per this number of seconds.
Timeout	3 Do not spend more than N seconds on getting requested value. Note: The agent does not kill timeouted User Parameters processes! (Default: 3. Valid range: 1-30)
Buffer Send	5 Do not keep data longer than N seconds in buffer. (Default: 5. Valid range: 1-3600)
Buffer Size	100

On the TLS-RELATED Parameters area, you need to perform the following configuration:

- TLS Connect – PSK
- TLS Accept – PSK
- TLS PSK IDENTITY – key-pfsense-01
- TLS PSK – fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff
(Create your own key)

TLS-RELATED Parameters	
TLS Connect	<input type="text" value="psk"/> How the agent should connect to server or proxy. Used for active checks. Only one value can be specified: unencrypted - connect without encryption psk - connect using TLS and a pre-shared key cert - connect using TLS and a certificate
TLS Accept	<input type="text" value="unencrypted"/> <input checked="" type="radio"/> psk <input type="radio"/> cert What incoming connections to accept. Multiple values can be specified: unencrypted - connect without encryption psk - connect using TLS and a pre-shared key cert - connect using TLS and a certificate
TLS CA	<input type="text" value="none"/> Top-level CA certificate for peer certificate verification.
TLS CA System	<input type="checkbox"/> Use the CA certificate list from the operating system. This option overr
TLS CRL	<input type="text" value="none"/> List of revoked certificates.
TLS Cert	<input type="text" value="none"/> Agent certificate.
TLS PSK Identity	<input type="text" value="key-pfsense-01"/> Unique, case sensitive string used to identify the pre-shared key.
TLS PSK	<input type="text" value="fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff"/>

If you need help to create a PSK key, you may use websites like:
<https://www.browserling.com/tools/random-hex>

After finishing the configuration, click on the Save button on the bottom part of the screen.

In our example, we used the following configuration:

- The Zabbix server has the IP address: 192.168.15.10.
- The PFsense firewall has the IP address: 192.168.15.11.
- The PfSense firewall hostname is: PFSENSE-FIREWALL
- The PSK Identification key was named: key-pfsense-01
- The communication will be encrypted using the following key:
fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff

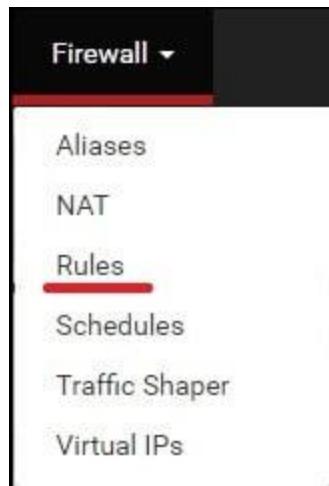
You have successfully installed the PFsense Zabbix agent!

PFsense - Zabbix Firewall Configuration

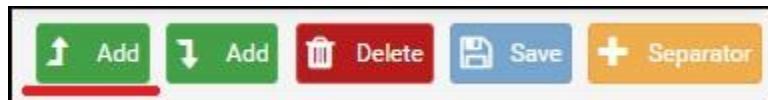
By default, the PFsense firewall does not allow external Zabbix connections to the WAN interface.

In our example we are going to create a firewall rule to allow the Zabbix communication.

Access the Pfsense Firewall menu and select the Rules option.



Click on the Add button to add a rule to the Top of the list.



On the Firewall rule creation screen, perform the following configuration:

- Action - Pass
- Interface - WAN
- Address family - IPV4
- Protocol - TCP

Edit Firewall Rule

Action	Pass
Choose what to do with packets that match the criteria specified below. Hint: the difference between block and reject is that with reject, a packet () whereas with block the packet is dropped silently. In either case, the origin	
Disabled	<input type="checkbox"/> Disable this rule Set this option to disable this rule without removing it from the list.
Interface	WAN
Choose the interface from which packets must come to match this rule.	
Address Family	IPv4
Select the Internet Protocol version this rule applies to.	
Protocol	TCP

On the Source configuration screen, you need to define the Zabbix server IP address.

This IP address should be allowed to communicate with the Zabbix agent installed on the PfSense firewall.

In our example, only the computer using the IP address 192.168.15.10 will be able to communicate with the PFsense Zabbix agent.

On the Firewall destination screen, perform the following configuration:

- Destination - Wan address
- Destination port range- From (Other) 10050 to (Other) 10050

On the Firewall Extra options screen, you may enter a description to the firewall rule.

Click on the Save button, you will be sent back to the Firewall configuration screen.

Now, you need to reload the firewall rules to apply the Zabbix communication firewall rule.

Click on the Apply changes button to reload the firewall configuration.

The firewall rule configuration has been changed.
The changes must be applied for them to take effect.

✓ Apply Changes

You have finished the PFsense firewall configuration to allow the Zabbix server communication using the WAN interface.

PFsense - Testing the Zabbix Agent Configuration

To test the Pfsense Zabbix agent configuration, access the command-line of your Zabbix server.

First, we need to create a file containing the PSK key to encrypt the communication.

Create a temporary PSK key file on the Zabbix server.

Insert the PSK Key previously defined inside this file.

```
touch /tmp/key-pfsense-01
vi /tmp/key-pfsense-01
fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff
```

Use the following command to test the communication between the Zabbix server and the Zabbix agent.

If everything worked, the Zabbix agent should report the agent version installed on the Pfsense server.

```
zabbix_get -s 192.168.15.11 -k "agent.version" --tls-connect=psk --tls-psk-identity="key-pfsense-01" --tls-psk-file=/tmp/key-pfsense-01
4.2.1
```

Keep in mind that you need to change the Zabbix agent IP address, the PSK identification name and the PSK key value to reflect your environment.

You have successfully performed a communication test between the Zabbix server and the Zabbix agent installed on the Pfsense firewall.

Congratulations!
You have installed the Zabbix agent on a computer running Pfsense!

You can now use the Zabbix server dashboard to add this computer to the network monitoring service.

Tutorial - Zabbix Monitoring PFSense

Now, we need to access the Zabbix server dashboard and add the Pfsense server as a Host.

Open your browser and enter the IP address of your web server plus /zabbix.

In our example, the following URL was entered in the Browser:

- <http://192.168.15.10/zabbix>

On the login screen, use the default username and default password.

- Default Username: Admin
- Default Password: zabbix



The image shows the Zabbix login interface. At the top center, the word "ZABBIX" is displayed in a large, bold, red sans-serif font. Below it, there are two input fields: one for "Username" and one for "Password", both represented by empty rectangular boxes. Underneath these fields is a checkbox labeled "Remember me for 30 days" with a checked mark. At the bottom of the form is a large blue rectangular button with the white text "Sign in". Below the "Sign in" button, the text "or sign in as guest" is visible in a smaller, gray font.

After a successful login, you will be sent to the Zabbix Dashboard.

The screenshot shows the Zabbix dashboard interface. At the top, there's a navigation bar with links for Monitoring, Inventory, Reports, Configuration, and Administration. Below that is a secondary navigation bar with links for Dashboard, Problems, Overview, Web, Latest data, Triggers, Graphs, Screens, Maps, Discovery, and Services. The main area is titled "Dashboard" and shows three sections: "Favourite graphs", "Favourite screens", and "Favourite maps". Each section has a message indicating "No graphs added.", "No screens added.", and "No maps added." respectively. At the bottom of each section, it says "Updated: 12:41:39".

On the dashboard screen, access the Configuration menu and select the Host option.

The screenshot shows the Zabbix Configuration menu. At the top, there's a navigation bar with links for Monitoring, Inventory, Reports, Configuration, and Administration. Below that is a secondary navigation bar with links for Host groups, Templates, Hosts, Maintenance, Actions, Event correlation, Discovery, and Services. The "Hosts" link is highlighted with a red box. At the bottom right of the menu, there are three buttons: "Create host" (highlighted with a red box), "Import", and "Delete".

On the top right of the screen, click on the Create host button.



On the Host configuration screen, you will have to enter the following information:

- Host Name - Enter a Hostname to identify the PFSense server.
- Visible Hostname - Repeat the hostname.
- New group - Enter a name to identify a group of similar devices.
- Agent Interface - Enter the IP address of the PFsesne server.

Here is the original image, before our configuration.

The screenshot shows the 'Hosts' configuration page in Zabbix. The 'Groups' tab is selected. In the 'In groups' section, there is a large empty box. In the 'Other groups' section, a list of monitoring templates is shown: Discovered hosts, Hypervisors, Linux servers, Templates, Templates/Applications, Templates/Databases, Templates/Modules, Templates/Network Devices, Templates/Operating Systems, and Templates/Servers Hardware. A 'New group' input field is present. Below the groups section, there are tabs for 'Agent interfaces', 'SNMP interfaces', 'JMX interfaces', and 'IPMI interfaces', each with an 'Add' button.

IP address	DNS name	Connect to	Port	Default
127.0.0.1		IP	DNS	10050

Here is the new image with our configuration.

The screenshot shows the 'Hosts' configuration page in Zabbix. The 'Groups' tab is selected. In the 'Groups' input field, 'Pfsense Firewall (new)' is selected. Below the input field, a note says '* At least one interface must exist.' The 'Agent interfaces' section shows an entry for IP address 192.168.15.11 with the 'IP' checkbox selected. The other tabs ('SNMP interfaces', 'JMX interfaces', 'IPMI interfaces') are visible but empty.

IP address	DNS name	Connect to	Port	Default
192.168.15.11		IP	DNS	10050

Next, we need to associate the host with a specific network monitor template.

By default, Zabbix comes with a large variety of monitoring templates.

Access the Templates tab on the top of the screen.

Click on the Select button and locate the template named: **Template OS FreeBSD**

Click on the Add option (1).

The screenshot shows the Zabbix interface with the 'Templates' tab selected. A search bar at the top contains the text 'Template OS FreeBSD'. Below it, there is a list area with a single item: '(1) Template OS FreeBSD'. At the bottom of this list is a blue 'Add' button, which is highlighted with a red box. To the right of the list is a 'Select' button. The tabs at the top are Host, Templates, IPMI, Tags, Macros, Inventory, and Encryption.

Next, we need to encrypt the communication between the Zabbix server and the PFsense firewall.

Access the Encryption tab on the top of the screen and perform the following configuration:

- Connections to host - PSK
- Connections from host - PSK
- PSK identity - key-pfsense-01
- PSK - fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff

Click on the Add button to finish the configuration.

The screenshot shows the Zabbix interface with the 'Encryption' tab selected. Under 'Connections to host', 'PSK' is selected. Under 'Connections from host', 'PSK' is checked. In the 'PSK identity' field, 'key-pfsense-01' is entered. In the 'PSK' field, 'fb6616cd582a2fa0aa161cab3423a9ca640c931b21c8c2e3b7132d6db75aadff' is entered. At the bottom are 'Add' and 'Cancel' buttons.

After a few minutes, you will be able to see the initial result on the Zabbix Dashboard.

The final result will take at least one hour.

By default, Zabbix will wait 1 hour to discover the number of interfaces available on the PfSense server.

By default, Zabbix will wait 1 hour before collect information from the network interfaces.

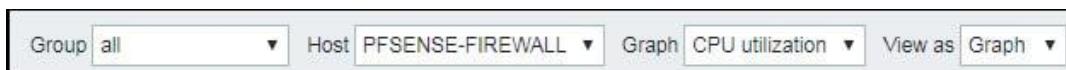
In order to test your configuration, access the Monitoring menu and click on the Graphs option.



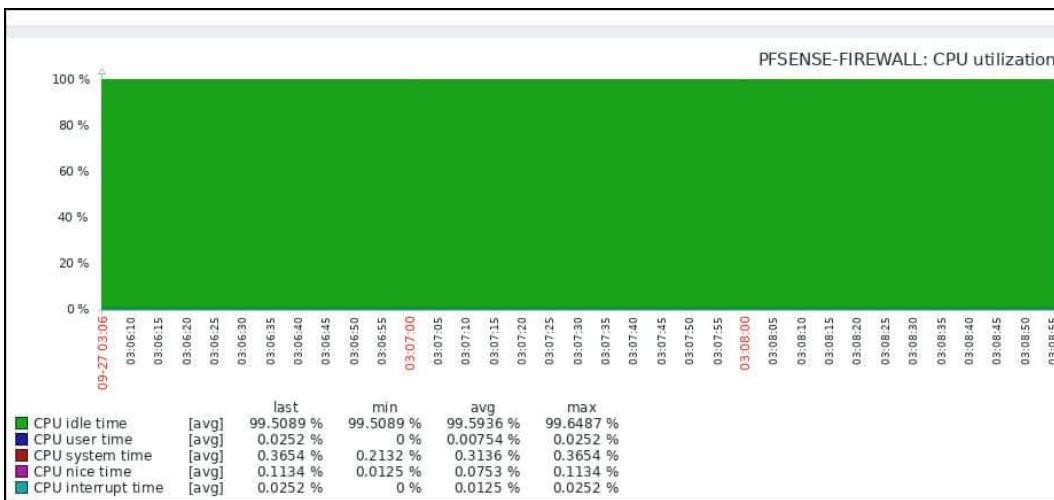
On the top right of the screen, select the group named ALL.

Select your PFsense computer host name.

Select the graph named: CPU UTILIZATION



You should be able to see the graphic of CPU utilization.



		last	min	avg	max
CPU idle time	[avg]	99.5089 %	99.5089 %	99.5936 %	99.6487 %
CPU user time	[avg]	0.0252 %	0 %	0.00754 %	0.0252 %
CPU system time	[avg]	0.3654 %	0.2132 %	0.3136 %	0.3654 %
CPU nice time	[avg]	0.1134 %	0.0125 %	0.0753 %	0.1134 %
CPU interrupt time	[avg]	0.0252 %	0 %	0.0125 %	0.0252 %

Congratulations!

You have configured the Zabbix server to monitor a PFsense computer!

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