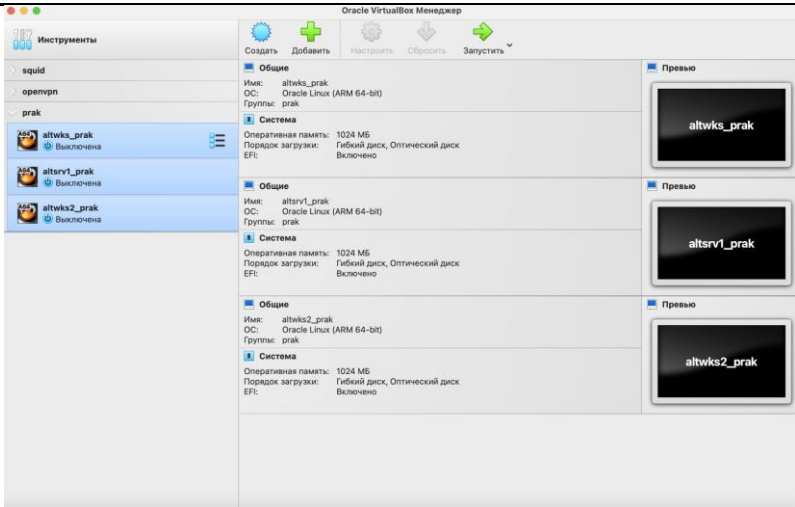
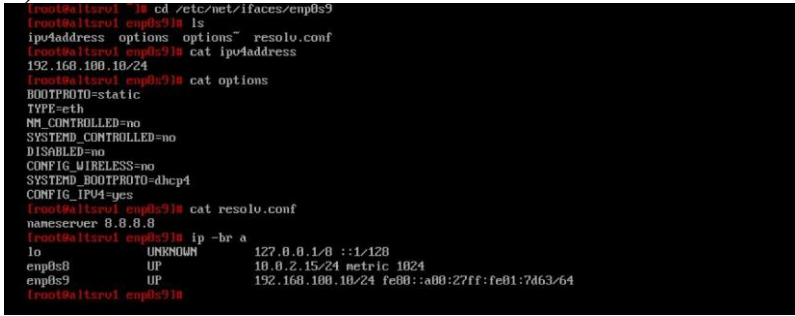


Цель практики: решение практических задач отрасли с использованием приобретенных навыков в сфере ИТ на примере проекта «Система мониторинга zabbix + portrges ».

Задачи для обучающихся

| Задачи | Описание решения, индивидуальный вклад | | | | | | | | | | | | |
|---|---|----------------|---|----------------|---------|---|---------------|---------|---|----------------|-----|---|---------|
| 1. Создать стенд (1 сервер и 2 клиента) | <div></div> <p>Создал стенд 2 altwks и 1 altsrv, настроил их на одну общую сеть "prak" и настроил интерфейсы на каждой машине:</p> <table><tr><td>altsrv</td><td>-</td><td>192.168.100.10</td></tr><tr><td>altwks1</td><td>-</td><td>192.168.100.2</td></tr><tr><td>altwks2</td><td>-</td><td>192.168.100.99</td></tr><tr><td>DNS</td><td>-</td><td>8.8.8.8</td></tr></table> <p>фотографии ниже</p> <p>1)</p> <div></div> <p>2)</p> | altsrv | - | 192.168.100.10 | altwks1 | - | 192.168.100.2 | altwks2 | - | 192.168.100.99 | DNS | - | 8.8.8.8 |
| altsrv | - | 192.168.100.10 | | | | | | | | | | | |
| altwks1 | - | 192.168.100.2 | | | | | | | | | | | |
| altwks2 | - | 192.168.100.99 | | | | | | | | | | | |
| DNS | - | 8.8.8.8 | | | | | | | | | | | |

| | |
|---|---|
| | <div><pre>[root@kali:~]# cd /etc/net/ifaces/enp0s9 [root@kali:~]# cat ip4address ip4address- options options- resolv.conf [root@kali:~]# cat ip4address ip4address- options options- resolv.conf [root@kali:~]# cat ip4address 192.168.100.1/24 [root@kali:~]# cat options BOOTPROTO=static TYPE=eth NM_CONTROLLED=no DISABLED=no CONFIG_WIRELESS=no SYSTEMD_BOOTPROTO=dhcp4 CONFIG_IPV4=yes SYSTEMD_CONTROLLED=no [root@kali:~]# cat resolv.conf nameserver 8.8.8.8 [root@kali:~]#</pre></div> <div>3)</div> <div><pre>[root@kali:~]# cat options BOOTPROTO=static TYPE=eth NM_CONTROLLED=no DISABLED=no CONFIG_WIRELESS=no SYSTEMD_BOOTPROTO=dhcp4 CONFIG_IPV4=yes SYSTEMD_CONTROLLED=no [root@kali:~]# cat resolv.conf nameserver 8.8.8.8 [root@kali:~]# cat ip4address 192.168.100.99/24 [root@kali:~]#</pre></div> |
| <div>2. На сервере установить и настроить zabbix + portrges</div> | <div>Для функционирования установил PostgreSQL, Apache2, PHP.</div> <div>Настройка Zabbix в терминале</div> <div>1) postgresql.service</div> <div><pre>● postgresql.service - PostgreSQL database server Loaded: loaded (/lib/systemd/system/postgresql.service; enabled; vendor preset: disabled) Active: active (running) since Mon 2025-06-09 18:56:00 MSK; 1h 3min ago Process: 12683 ExecStart=/usr/bin/pg_ctl start -D \$PGDATA -s -o -p \$(PGPORT) -w -t 300 (code=exited, status=0/SUCCESS) Main PID: 12685 (postgres) Tasks: 28 (limit: 65536) Memory: 114.0M CPU: 5.915s CGroup: /system.slice/postgresql.service ┌─ 12685 /usr/bin/postgres -D /var/lib/pgsql/data -p 5432 ┌─ 12686 postgres: logger ┌─ 12687 postgres: checkpoint ┌─ 12688 postgres: background writer ┌─ 12690 postgres: walwriter ┌─ 12691 postgres: autovacuum launcher ┌─ 12692 postgres: logical replication launcher ┌─ 12693 postgres: zabbix zabbix 127.0.0.1(34096) idle ┌─ 12694 postgres: zabbix zabbix 127.0.0.1(34105) idle ┌─ 12695 postgres: zabbix zabbix 127.0.0.1(34106) idle ┌─ 12699 postgres: zabbix zabbix 127.0.0.1(57370) idle ┌─ 12700 postgres: zabbix zabbix 127.0.0.1(57382) idle ┌─ 12701 postgres: zabbix zabbix 127.0.0.1(57398) idle ┌─ 12702 postgres: zabbix zabbix 127.0.0.1(57414) idle ┌─ 12704 postgres: zabbix zabbix 127.0.0.1(59772) idle ┌─ 12706 postgres: zabbix zabbix 127.0.0.1(59480) idle ┌─ 12708 postgres: zabbix zabbix 127.0.0.1(59888) idle ┌─ 12711 postgres: zabbix zabbix 127.0.0.1(59922) idle ┌─ 12739 postgres: zabbix zabbix 127.0.0.1(32868) idle ┌─ 12780 postgres: zabbix zabbix 127.0.0.1(39572) idle ┌─ 13605 postgres: zabbix zabbix 127.0.0.1(54265) idle ┌─ 13608 postgres: zabbix zabbix 127.0.0.1(40020) idle ┌─ 13612 postgres: zabbix zabbix 127.0.0.1(40038) idle ┌─ 13613 postgres: zabbix zabbix 127.0.0.1(43174) idle ┌─ 13647 postgres: zabbix zabbix 127.0.0.1(43138) idle ┌─ 13649 postgres: zabbix zabbix 127.0.0.1(43142) idle ┌─ 13651 postgres: zabbix zabbix 127.0.0.1(43154) idle ┌─ 13652 postgres: zabbix zabbix 127.0.0.1(43162) idle mon 09 18:56:00 altsvrl systemd[1]: Starting PostgreSQL database server... mon 09 18:56:00 altsvrl pg_ctl[12685]: 2025-06-09 18:56:00.088 MSK [12685] СООБЩЕНИЕ: передача вышла в протокол процессу сбора протоколов [lines 1-4]</pre></div> <div>2) zabbix.service</div> |

```

zabbix_pgsql.service - ZABBIX Server with PostgreSQL DB
Loaded: loaded (/lib/systemd/system/zabbix_pgsql.service; enabled; vendor preset: disabled)
Active: active (running) since Mon 2025-06-09 18:39:16 MSK; 1h 21min ago
Main PID: 12118 (zabbix_pgsql)
Tasks: 77 (limit: 693)
Memory: 58.7M
CPU: 51.967s
CGroup: /system.slice/zabbix_pgsql.service
├─ 12118 /usr/sbin/zabbix_pgsql -f
├─ 12120 /usr/sbin/zabbix_pgsql: ha manager"
├─ 12122 /usr/sbin/zabbix_pgsql: service manager #1 [processed 0 events, updated 0 event tags, deleted 0 problems, synced 0 service updates, id
├─ 12123 /usr/sbin/zabbix_pgsql: configuration synchronizer [synced configuration in 0.027321 sec, idle 10 sec]"
├─ 12127 /usr/sbin/zabbix_pgsql: alert manager #1 [sent 0, failed 0 alerts, idle 5.013223 sec during 5.013311 sec]"
├─ 12128 /usr/sbin/zabbix_pgsql: alerter #1 started"
├─ 12129 /usr/sbin/zabbix_pgsql: alerter #2 started"
├─ 12130 /usr/sbin/zabbix_pgsql: alerter #3 started"
├─ 12131 /usr/sbin/zabbix_pgsql: preprocessing manager #1 [queued 11, processed 10 values, idle 5.001106 sec during 5.001787 sec]"
├─ 12132 /usr/sbin/zabbix_pgsql: lld manager #1 [processed 0 LLD rules, idle 5.005295sec during 5.005330 sec]"
├─ 12133 /usr/sbin/zabbix_pgsql: lld worker #1 [processed 1 LLD rules, idle 476.976586 sec during 477.014829 sec]"
├─ 12134 /usr/sbin/zabbix_pgsql: lld worker #2 [processed 1 LLD rules, idle 476.963392 sec during 477.001984 sec]"
├─ 12135 /usr/sbin/zabbix_pgsql: housekeeper [deleted 0 hist/trends, 0 items/triggers, 0 events, 0 sessions, 0 alarms, 0 audit items, 0 autore
├─ 12136 /usr/sbin/zabbix_pgsql: timer #1 [updated 0 hosts, suppressed 0 events in 0.003360 sec, idle 59 sec]"
├─ 12137 /usr/sbin/zabbix_pgsql: http poller #1 [got 0 values in 0.000111 sec, idle 5 sec]"
├─ 12138 /usr/sbin/zabbix_pgsql: browser poller #1 [got 0 values in 0.000030 sec, idle 5 sec]"
├─ 12139 /usr/sbin/zabbix_pgsql: discovery manager #1 [processing 0 rules, 0 unsaved checks]"
├─ 12140 /usr/sbin/zabbix_pgsql: history synchronizer #1 [processed 1 values, 1 triggers in 0.002099 sec, idle 1 sec]"
├─ 12141 /usr/sbin/zabbix_pgsql: history synchronizer #2 [processed 0 values, 0 triggers in 0.000045 sec, idle 1 sec]"
├─ 12142 /usr/sbin/zabbix_pgsql: history synchronizer #3 [processed 0 values, 0 triggers in 0.000010 sec, idle 1 sec]"
├─ 12143 /usr/sbin/zabbix_pgsql: history synchronizer #4 [processed 0 values, 0 triggers in 0.000014 sec, idle 1 sec]"
├─ 12144 /usr/sbin/zabbix_pgsql: escalator #1 [processed 0 escalations in 0.001173 sec, idle 3 sec]"
├─ 12145 /usr/sbin/zabbix_pgsql: proxy poller #1 [exchanged data with 0 proxies in 0.000077 sec, idle 5 sec]"
├─ 12146 /usr/sbin/zabbix_pgsql: self-monitoring [processed data in 0.000028 sec, idle 1 sec]"
├─ 12152 /usr/sbin/zabbix_pgsql: task manager [processed 0 task(s) in 0.000032 sec, idle 5 sec]"
├─ 12153 /usr/sbin/zabbix_pgsql: poller #1 [got 0 values in 0.000005 sec, idle 5 sec]"
├─ 12159 /usr/sbin/zabbix_pgsql: poller #2 [got 0 values in 0.000005 sec, idle 5 sec]"
├─ 12162 /usr/sbin/zabbix_pgsql: poller #3 [got 0 values in 0.000005 sec, idle 5 sec]"
├─ 12163 /usr/sbin/zabbix_pgsql: poller #4 [got 0 values in 0.000006 sec, idle 5 sec]"
├─ 12165 /usr/sbin/zabbix_pgsql: poller #5 [got 0 values in 0.000005 sec, idle 5 sec]"
├─ 12167 /usr/sbin/zabbix_pgsql: unreachable poller #1 [got 0 values in 0.000006 sec, idle 5 sec]"
├─ 12168 /usr/sbin/zabbix_pgsql: trapper #1 [processed data in 0.000000 sec, waiting for connection]"
├─ 12169 /usr/sbin/zabbix_pgsql: trapper #2 [processed data in 0.000000 sec, waiting for connection]"
lines 1-41

```

3) zabbix_agentd.service

```

systemctl status zabbix_agentd.service
zabbix_agentd.service - ZABBIX Monitor Agent
Loaded: loaded (/lib/systemd/system/zabbix_agentd.service; disabled; vendor preset: disabled)
Active: active (running) since Mon 2025-06-09 18:11:22 MSK; 1h 48min ago
Main PID: 11266 (zabbix_agentd)
Tasks: 6 (limit: 693)
Memory: 4.9M
CPU: 9.821s
CGroup: /system.slice/zabbix_agentd.service
├─ 11266 /usr/sbin/zabbix_agentd -f
├─ 11267 /usr/sbin/zabbix_agentd: collector [idle 1 sec]"
├─ 11268 /usr/sbin/zabbix_agentd: listener #1 [waiting for connection]"
├─ 11269 /usr/sbin/zabbix_agentd: listener #2 [waiting for connection]"
├─ 11270 /usr/sbin/zabbix_agentd: listener #3 [waiting for connection]"
├─ 11271 /usr/sbin/zabbix_agentd: active checks #1 [idle 1 vsec]"
MON 09 18:11:22 altsrv1 systemd[1]: Started ZABBIX Monitor Agent.
MON 09 18:11:22 altsrv1 zabbix_agentd[11266]: Starting Zabbix Agent [vbox]. Zabbix 6.0.26 (revision 623853fd6ef).
MON 09 18:11:22 altsrv1 zabbix_agentd[11266]: Press Ctrl+C to exit.

```

4) httpd2.service

```

systemctl status httpd2.service
httpd2.service - The Apache2 HTTP Server
Loaded: loaded (/lib/systemd/system/httpd2.service; enabled; vendor preset: disabled)
Active: active (running) since Sun 2025-06-16 01:13:46 MSK; 17s ago
Process: 2592 ExecStartPre=/usr/sbin/httpd2-conf.sh generate httpd2.config (code=exited, status=0/SUCCESS)
Main PID: 2628 (httpd2)
Status: Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec: 0 B/sec"
Tasks: 6 (limit: 693)
Memory: 80.0M
CPU: 20.2ms
CGroup: /system.slice/httpd2.service
├─ 2560 /usr/sbin/httpd2 -f -DFOREGROUND -k start
├─ 2562 /usr/sbin/httpd2 -f -DFOREGROUND -k start
├─ 2564 /usr/sbin/httpd2 -f -DFOREGROUND -k start
├─ 2567 /usr/sbin/httpd2 -f -DFOREGROUND -k start
├─ 2569 /usr/sbin/httpd2 -f -DFOREGROUND -k start
├─ 2583 /usr/sbin/httpd2 -f -DFOREGROUND -k start
MON 09 01:13:46 altsrv1 systemd[1]: Starting The Apache2 HTTP Server...
MON 09 01:13:46 altsrv1 httpd2-conf.sh[2569]: Certificate will not expire
MON 09 01:13:46 altsrv1 sh[2628]: AH00548: NameVirtualHost has no effect and will be removed in the next release /etc/httpd2/conf/sites-enabled/ports_all.conf:1
MON 09 01:13:46 altsrv1 sh[2628]: AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 10.0.2.15. Set the 'ServerName'
MON 09 01:13:46 altsrv1 systemd[1]: Started The Apache2 HTTP Server.

```

Настройка Zabbix через web интерфейс (<http://192.168.100.10/zabbix>)

1)

ZABBIX

Welcome

Check pre-requisites

Configure DB connection

Settings

Pre-installation summary

Install

Settings

Zabbix server name:

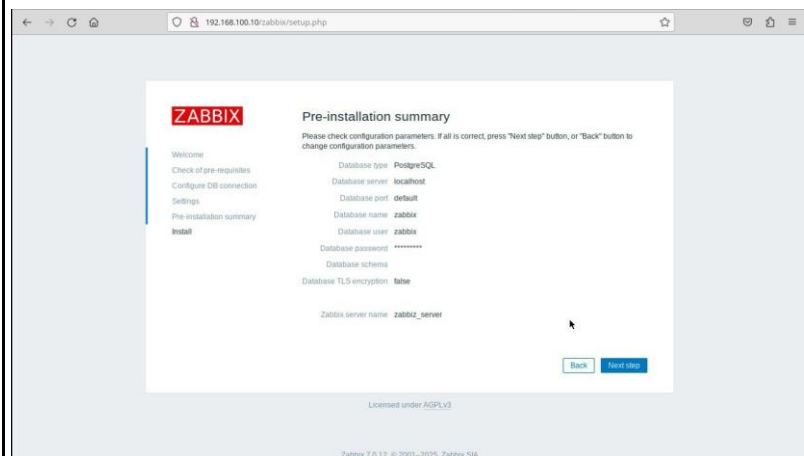
Default time zone:

Default theme:

Licensed under AGPLv3

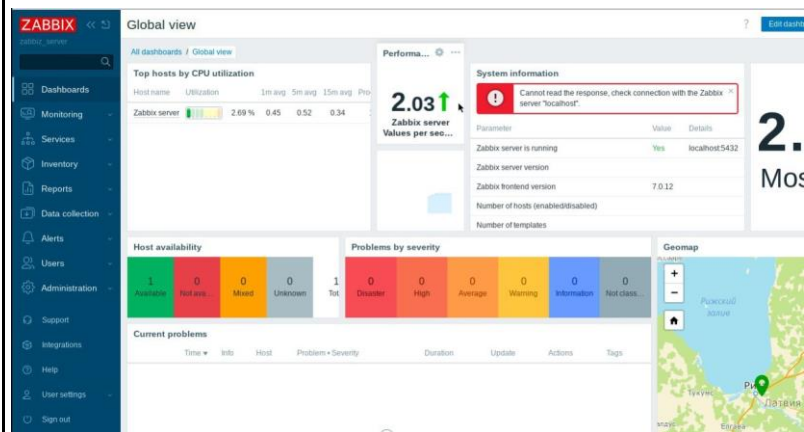
Zabbix 7.0.12, © 2002–2025, Zabbix SIA

2) Настройка Zabbix через web интерфейс



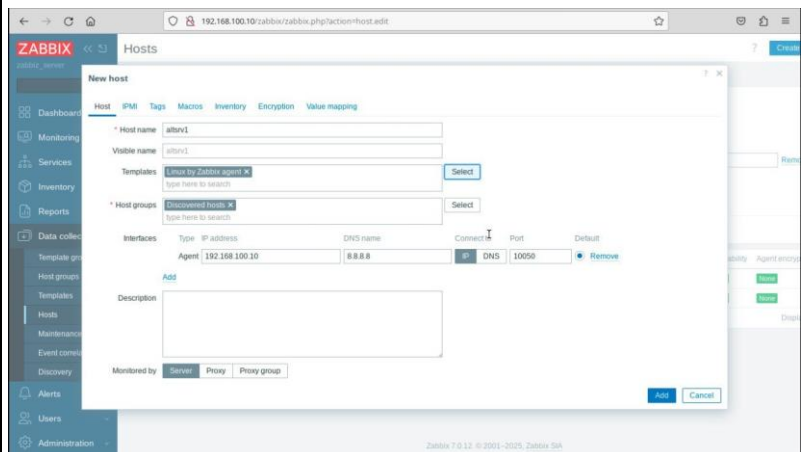
3) Настройка Zabbix через web интерфейс

4) видим главное меню



3.Добавить узлы (клиенты) на сервер zabbix

5) добавляем узел (altsrv1)



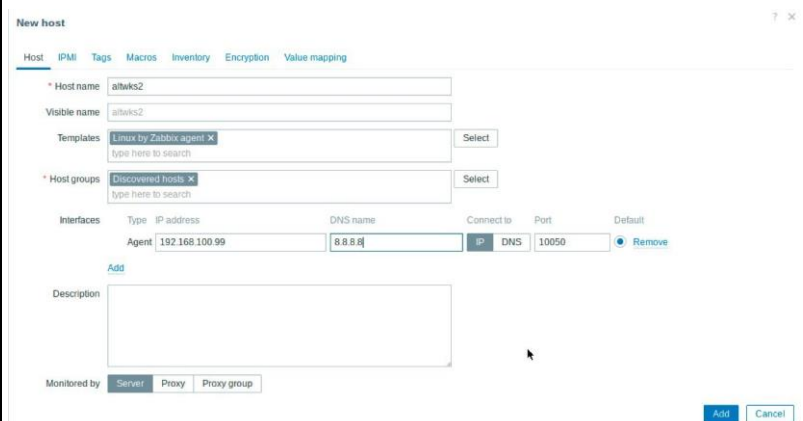
6)добавили altsrv1

7) метрики altsrv

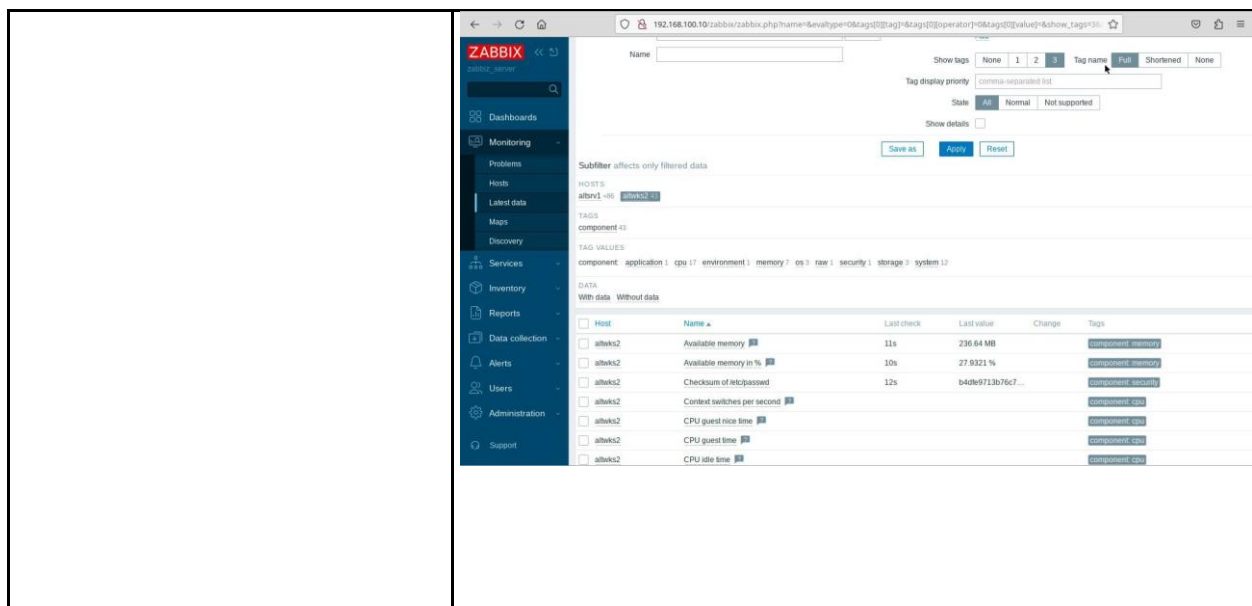
The screenshot shows the 'Latest data' page in the Zabbix web interface for host 'altsrv1'. The table displays various system metrics and their current values. The metrics include available memory, available memory in %, checksum of /etc/passwd, content switches per second, CPU guest time, CPU guest time, CPU idle time, CPU interrupt time, CPU iowait time, CPU nice time, CPU nice time, CPU softirq time, CPU steal time, CPU system time, CPU user time, CPU utilization, free swap space, free swap space in %, and FS [j]. Get data.

| Host | Name | Last check | Last value | Change | Tags |
|---------|-----------------------------|------------|--------------------|------------|--------------------|
| altsrv1 | Available memory | 56s | 165.42 MB | -21.86 MB | component:memory |
| altsrv1 | Available memory in % | 55s | 19.5241 % | -2.5804 % | component:memory |
| altsrv1 | Checksum of /etc/passwd | 21m 57s | b4de9713b76c7... | | component:security |
| altsrv1 | Content switches per second | 39s | 1805.5228 | -226.357 | component:cpu |
| altsrv1 | CPU guest time | 37s | 0 % | | component:cpu |
| altsrv1 | CPU guest time | 38s | 0 % | | component:cpu |
| altsrv1 | CPU idle time | 36s | 86.4937 % | +1.4845 % | component:cpu |
| altsrv1 | CPU interrupt time | 35s | 0 % | | component:cpu |
| altsrv1 | CPU iowait time | 42s | 0.1338 % | -0.8563 % | component:cpu |
| altsrv1 | CPU nice time | 52s | 0 % | | component:cpu |
| altsrv1 | CPU softirq time | 53s | 0 % | | component:cpu |
| altsrv1 | CPU steal time | 54s | 0 % | | component:cpu |
| altsrv1 | CPU system time | 10s | 4.6765 % | +2.4323 % | component:cpu |
| altsrv1 | CPU user time | 9s | 17.9685 % | +12.9785 % | component:cpu |
| altsrv1 | CPU utilization | 36s | 13.5063 % | -1.4845 % | component:cpu |
| altsrv1 | Free swap space | 11s | 115.36 MB | -8.61 MB | component:memory |
| altsrv1 | Free swap space in % | 3s | 13.6498 % | -0.9874 % | component:memory |
| altsrv1 | FS [j]. Get data | 33s | (?name="/",topl... | | component:storage |

7)добавляем altwks2

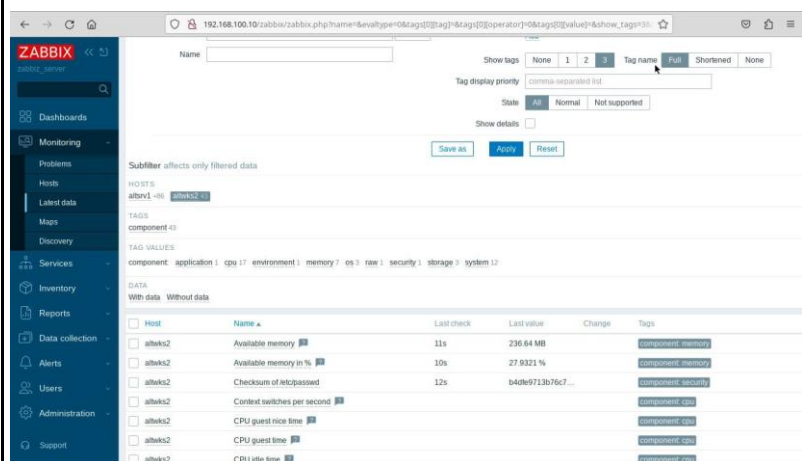


8) видим метрики altwks2



4. Собирать метрики
с клиентов в
реальном времени

1) метрики altwk2



2) метрики altsrv1

Normal 17

Not supported

192.168.190.19/zabbix/zabbix.php?name=&event=0&arg0[0]=operator%2F0&arg0[1]=value%2Fshow_large%2F

zabbix

zabbix_server

Monitoring

Problems

Hosts

Latest data

Maps

Discovery

Services

Inventory

Reports

Data collection

Alerts

Users

Administration

Support

With data

Without data

| Host | Name | Last check | Last value | Change | Tags |
|--------|-----------------------------|------------|-----------------------|------------|------------------------------------|
| altbv1 | Available memory | 56s | 165.42 MB | -21.86 MB | component:memory |
| altbv1 | Available memory in % | 55s | 19.5241 % | -2.5804 % | component:memory |
| altbv1 | Checksum of /etc/passwd | 21m 57s | b4de9713b76c7... | | component:security |
| altbv1 | Context switches per second | 39s | 1805.5228 | -226.357 | component:cpu |
| altbv1 | CPU guest nice time | 37s | 0 % | | component:cpu |
| altbv1 | CPU guest time | 38s | 0 % | | component:cpu |
| altbv1 | CPU idle time | 36s | 86.4937 % | +1.4845 % | component:cpu |
| altbv1 | CPU interrupt time | 35s | 0 % | | component:cpu |
| altbv1 | CPU iowait time | 42s | 0.1338 % | -0.8563 % | component:cpu |
| altbv1 | CPU nice time | 52s | 0 % | | component:cpu |
| altbv1 | CPU softirq time | 53s | 0 % | | component:cpu |
| altbv1 | CPU steal time | 54s | 0 % | | component:cpu |
| altbv1 | CPU system time | 10s | 4.6765 % | +2.4323 % | component:cpu |
| altbv1 | CPU user time | 9s | 17.9685 % | +12.9785 % | component:cpu |
| altbv1 | CPU utilization | 36s | 13.5063 % | -1.4845 % | component:cpu |
| altbv1 | Free swap space | 11s | 115.36 MB | -8.81 MB | component:memory component:storage |
| altbv1 | Free swap space in % | 3s | 13.6498 % | -0.9674 % | component:memory component:storage |
| altbv1 | FS [j]_Get data | 33s | ("biname"/"/",topl... | | component:cpu component:storage |

zabbix_server: Latest data

Th, 9 Nov, 22:09