

Module C2 Practical Work Report

Задание C2.7

1. Разверните *Prometheus Stack* через *docker-compose*, в котором будет:

- *Prometheus*,
- *Grafana*,
- *Node Exporter*,
- *Blackbox Exporter*,
- *AlertManager*.

2. Соберите метрики с <https://lms.skillfactory.ru> через *Blackbox*, соберите метрики с вашего сервера через *Node Exporter*.

3. Создайте *dashboard* в *Grafana*, в котором будут отображены следующие метрики:

На вашем сервере (или локальной машине):

- время работы (*Uptime*);
- нагрузка на процессор (*CPU*) в %;
- использование памяти (*RAM*) в %;
- использование диска в %.

На lms.skillfactory.ru:

- возвращаемый статус-код;
- задержка ответа сайта;
- срок действия сертификата.

4. Добавьте алерты в *AlertManager* на следующие события:

- изменился статус-код сайта lms.skillfactory.ru,
- задержка превышает 5 секунд lms.skillfactory.ru,
- сервер перезагрузился (через метрику *Uptime*).

В Телеграм алерты можно не отправлять. Если есть желание, в качестве дополнительного задания можно кидать их себе на почту.

Оформите решение в виде скриншотов дашборда, скриншотов интерфейса *AlertManager* и конфигов используемых сервисов.

На вашем сервере (или локальной машине):

```
время работы (Uptime);
node_boot_time_seconds
нагрузка на процессор (CPU) в %;
100 - (avg by(instance) (irate(node_cpu_seconds_total{mode="idle"}[5m])) * 100)
использование памяти (RAM) в %;
100 - ((node_memory_MemFree_bytes * 100) / node_memory_MemTotal_bytes)
использование диска в %.
100 — ((node_filesystem_avail_bytes{mountpoint="/",fstype!="rootfs"} * 100) / node_filesystem_size_bytes{mountpoint="/",fstype!="rootfs"})
```

На lms.skillfactory.ru:

```
возвращаемый статус-код;
probe_http_status_code
задержка ответа сайта;
sum(probe_http_duration_seconds)
срок действия сертификата.
(probe_ssl_earliest_cert_expiry - time())/86400
```

Добавьте алерты в AlertManager на следующие события:

```
изменился статус-код сайта lms.skillfactory.ru,
probe_http_status_code != 200
задержка превышает 5 секунд lms.skillfactory.ru,
sum(probe_http_duration_seconds)>5.0
сервер перезагрузился (через метрику Uptime).
node_boot_time_seconds < 1000
```

```

#!/bin/sh
# -----
# Test Prometheus Image with Docker / 2022_04_08 / ANa
# -----

echo ----- Create temp folder prometheus
mkdir ./prometheus_root
chmod 777 ./prometheus_root
cd prometheus_root
mkdir ./prometheus
chmod 777 ./prometheus
mkdir ./blackbox
chmod 777 ./blackbox
mkdir ./grafana
chmod 777 ./grafana
mkdir ./grafana/provisioning
chmod 777 ./grafana/provisioning
mkdir ./alertmanager
chmod 777 ./alertmanager

echo "\n\n"
echo ----- Create prometheus/prometheus.yml
cat << EOF > ./prometheus/prometheus.yml
# ----- prometheus/prometheus.yml START -----
alerting:
  alertmanagers:
    - scheme: http
    - static_configs:
        - targets:
            - alertmanager:9093
rule_files:
  - "alert_rules.yml"

scrape_configs:
  - job_name: node
    scrape_interval: 5s
    static_configs:
      - targets: ['node-exporter:9100']

  - job_name: blackbox
    metrics_path: /probe
    params:
      module: [http_2xx]
    static_configs:
      - targets:
          - https://lms.skillfactory.ru/
    relabel_configs:
      - source_labels: [__address__]
        target_label: __param_target
      - source_labels: [__param_target]
        target_label: instance
      - target_label: __address__
        replacement: blackbox-exporter:9115
# ----- prometheus/prometheus.yml END -----
EOF
cat ./prometheus/prometheus.yml

echo "\n\n"
echo ----- Create prometheus/alert_rules.yml
cat << EOF > ./prometheus/alert_rules.yml
# ----- prometheus/alert_rules.yml START -----
groups:
  - name: alert_rules
    rules:

    - alert: lg5_ERROR_HTTP_responce_wrong_status
      expr: probe_http_status_code != 200
      for: 1m
      labels:
        severity: critical

```

```

annotations:
  summary: "Wrong HTTP response status"

- alert: Ig5_WARN_Long_HTTP_Response_Time
  expr: avg_over_time(probe_http_duration_seconds[1m]) > 5
  for: 1m
  labels:
    severity: warning
  annotations:
    summary: "WARN: HTTP request took more than 5s"

- alert: Ig5_INFO_Host_Server_Reboot
  expr: node_boot_time_seconds < 1000
  for: 1m
  labels:
    severity: info
  annotations:
    summary: "INFO: Host server reboot"

- alert: Ig5_INFO_Host_Working
  expr: node_boot_time_seconds > 1000
  for: 1m
  labels:
    severity: info
  annotations:
    summary: "INFO: Host server is working"
# ----- prometheus/alert_rules.yml END -----
EOF
cat ./prometheus/alert_rules.yml

echo "\n\n"
echo ----- Create blackbox/blackbox.yml
cat << EOF > ./blackbox/blackbox.yml
# ----- blackbox/blackbox.yml START -----
modules:
  http_2xx:
    http:
      no_follow_redirects: false
      preferred_ip_protocol: ip4
      valid_http_versions:
        - HTTP/1.1
        - HTTP/2
      valid_status_codes: []
      prober: http
      timeout: 10s
# ----- blackbox/blackbox.yml END -----
EOF
cat ./blackbox/blackbox.yml

echo "\n\n"
echo ----- Create alertmanager/alertmanager.yml
cat << EOF > ./alertmanager/alertmanager.yml
# ----- alertmanager/alertmanager.yml START -----
global:
  resolve_timeout: 5m

route:
  group_by: ['alertname']
  group_wait: 10s
  group_interval: 10s
  repeat_interval: 10s
  receiver: 'email'
receivers:
- name: 'email'
  email_configs:
    - to: 'silverstandart@gmail.com'
      from: 'dostan@gmail.com'
      smarthost: smtp.gmail.com:587
      auth_username: 'dostan@gmail.com'

```

```

auth_identity: 'dostan@gmail.com'
auth_password: 'BTh50fzp+af87s8f%a8d6f9a3nnv8_HqDHNtkk'
inhibit_rules:
- source_match:
  severity: 'critical'
target_match:
  severity: 'warning'
  equal: ['alertname', 'dev', 'instance']
# ----- alertmanager/alertmanager.yml END -----
EOF
cat ./alertmanager/alertmanager.yml

echo "\n\n"
echo ----- Create docker-compose.yml
cat << EOF > ./docker-compose.yml
# ----- docker-compose.yml START -----
version: '3.2'
services:
  prometheus:
    image: prom/prometheus:latest
    volumes:
      - ./prometheus:/etc/prometheus/
    hostname: prometheus
    command:
      - --config.file=/etc/prometheus/prometheus.yml
    ports:
      - 127.0.0.1:9090:9090
    restart: always
    depends_on:
      - alertmanager

  alertmanager:
    image: prom/alertmanager:v0.21.0
    volumes:
      - ./alertmanager:/etc/alertmanager/
    hostname: alertmanager
    command:
      - --config.file=/etc/alertmanager/alertmanager.yml
      - --storage.path=/etc/alertmanager/data
    ports:
      - 127.0.0.1:9093:9093
    restart: always

  node-exporter:
    image: prom/node-exporter
    volumes:
      - /proc:/host/proc:ro
      - /sys:/host/sys:ro
      - /:/rootfs:ro
    hostname: node-exporter
    command:
      - --path.procfs=/host/proc
      - --path.sysfs=/host/sys
      - --collector.filesystem.ignored-mount-points
      -
      ^/(sys|proc|dev|host|etc|rootfs/var/lib/docker/containers|rootfs/var/lib/docker/overlay2|rootfs/run/docker/netns|rootfs/var/lib/docker/aufs)($$|/
      )
    ports:
      - 127.0.0.1:9100:9100
    restart: always

  blackbox-exporter:
    image: prom/blackbox-exporter
    volumes:
      - ./blackbox:/config
    hostname: blackbox-exporter
    command:
      - --config.file=/config/blackbox.yml
    ports:
      - 127.0.0.1:9115:9115
    restart: always

```

```
grafana:
  image: grafana/grafana
  volumes:
    - ./grafana:/var/lib/grafana
    - ./grafana/provisioning:/etc/grafana/provisioning/
  depends_on:
    - prometheus
  ports:
    - 127.0.0.1:3000:3000
  restart: always

# ----- docker-compose.yml END -----
EOF
cat ./docker-compose.yml
```

```
echo ----- Create Image and Run
docker compose build --no-cache
docker compose up -d
sleep 5
echo "\n"
docker ps
echo "\ngrafana available in 127.0.0.1:3000 with credentials admin / admin\n"
```

```
andrey@andrey-VirtualBox: ~/DEV_HOME/c2.2

# 6857a256401b Pull complete 18.6s
# e0172d4c28d1 Pull complete 22.7s
# 9079a82208b5 Pull complete 25.8s
# 76847fb9bc28 Pull complete 43.5s
# f8f22df57058 Pull complete 43.6s
# 69ba24fb8c98 Pull complete 43.7s
# f582af5192c7 Pull complete 43.8s
[+] Running 6/6
# Network prometheus_root default Created 0.1s
# Container prometheus_root-blackbox-exporter-1 Started 1.6s
# Container prometheus_root-alertmanager-1 Started 1.6s
# Container prometheus_root-node-exporter-1 Started 1.5s
# Container prometheus_root-prometheus-1 Started 1.1s
# Container prometheus_root-grafana-1 Started 1.5s

CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                               NAMES
afb84b970f1f   grafana/grafana                     "/run.sh"               7 seconds ago Up 5 seconds  127.0.0.1:3000->3000/tcp            prometheus_root-grafana-1
9b71b2c664fa   prom/prometheus:latest              "/bin/prometheus --c..." 7 seconds ago Up 5 seconds  127.0.0.1:9090->9090/tcp            prometheus_root-prometheus-1
2950dde5e8f    prom/blackbox-exporter               "/bin/blackbox_expor..." 8 seconds ago Up 5 seconds  127.0.0.1:9115->9115/tcp            prometheus_root-blackbox-exporter-1
e57b92541244   prom/node-exporter                  "/bin/node_exporter -..." 8 seconds ago Up 5 seconds  127.0.0.1:9100->9100/tcp            prometheus_root-node-exporter-1
365d629f82a1   prom/alertmanager:v0.21.0           "/bin/alertmanager -..." 8 seconds ago Up 5 seconds  127.0.0.1:9093->9093/tcp            prometheus_root-alertmanager-1

grafana available in 127.0.0.1:3000 with credentials admin / admin
andrey@andrey-VirtualBox:~/DEV_HOME/c2.2$
```

Prometheus Time Series x Alertmanager x Blackbox Exporter x Sent Mail - dostan.eldoso x +

127.0.0.1:9090/alerts

90% ☆

Prometheus Alerts Graph Status Help

Inactive (3) Pending (0) Firing (1)

Filter by name or labels

Show annotations

/etc/prometheus/alert_rules.yml > alert_rules

inactive firing (1)

Ig5_ERROR_HTTP_responce_wrong_status (0 active)

name: Ig5_ERROR_HTTP_responce_wrong_status

expr: probe_http_status_code != 200

for: 1m

labels:

severity: critical

annotations:

summary: Wrong HTTP responce status

Ig5_WARN_Long_HTTP_Response_Time (0 active)

name: Ig5_WARN_Long_HTTP_Response_Time

expr: avg_over_time(probe_http_duration_seconds[1m]) > 5

for: 1m

labels:

severity: warning

annotations:

summary: WARN: HTTP request took more than 5s

Ig5_INFO_Host_Server_Reboot (0 active)

Ig5_INFO_Host_Working (1 active)

name: Ig5_INFO_Host_Working

expr: node_boot_time_seconds > 1000

for: 1m

labels:

severity: info

annotations:

summary: INFO: Host server is working

| Labels | State | Active Since | Value |
|--|--------|--------------------------------|------------|
| alertname=Ig5_INFO_Host_Working instance=node-exporter:9100 job=node severity=info | FIRING | 2022-04-10T00:32:15.551272403Z | 1649540633 |

Prometheus Time Series x Alertmanager x Blackbox Exporter x Sent Mail - dostan.eldoso x +

127.0.0.1:9093/#/alerts

90% ☆

Alertmanager Alerts Silences Status Help

New Silence

Filter Group

Receiver: All Silenced Inhibited

+

Silence

Custom matcher, e.g. env="production"

Expand all groups

alertname="Ig5_INFO_Host_Working" + 1 alert

00:33:15, 2022-04-10 (UTC) Info Source Silence

summary: INFO: Host server is working

instance="node-exporter:9100" +

job="node" +

severity="info" +

Prometheus Time SeriesAlertmanagerBlackbox Exporter

127.0.0.1:9093/#/status

```
smtp_hello: localhost
smtp_require_tls: true
pagerduty_url: https://events.pagerduty.com/v2/enqueue
opsgenie_api_url: https://api.opsgenie.com/
wechat_api_url: https://qyapi.weixin.qq.com/cgi-bin/
victorops_api_url: https://alert.victorops.com/integrations/generic/20131114/alert/
route:
  receiver: email
  group_by:
    - alertname
  group_wait: 10s
  group_interval: 10s
  repeat_interval: 10s
inhibit_rules:
- source_match:
    severity: critical
  target_match:
    severity: warning
equal:
- alertname
- dev
- instance
receivers:
- name: email
  email_configs:
  - send_resolved: false
    to: silverstandart@gmail.com
    from: dostan@gmail.com
    hello: localhost
    smarthost: smtp.gmail.com:587
    auth_username: dostan@gmail.com
    auth_password: <secret>
    auth_identity: dostan@gmail.com
    headers:
      From: dostan@gmail.com
      Subject: '{{ template "email.default.subject" . }}'
      To: silverstandart@gmail.com
      html: '{{ template "email.default.html" . }}'
    require_tls: true
  templates: []
```

Prometheus Time SeriesAlertmanagerBlackbox Exporter

127.0.0.1:9115

Blackbox Exporter

[Probe prometheus.io for http_2xx](#)

[Debug probe prometheus.io for http_2xx](#)

[Metrics](#)

[Configuration](#)

Recent Probes

| Module | Target | Result | Debug |
|----------|------------------------------|---------|----------------------|
| http_2xx | https://lms.skillfactory.ru/ | Failure | Logs |
| http_2xx | https://lms.skillfactory.ru/ | Failure | Logs |
| http_2xx | https://lms.skillfactory.ru/ | Failure | Logs |
| http_2xx | https://lms.skillfactory.ru/ | Failure | Logs |

Node Exporter

127.0.0.1:9100

Node Exporter

[Metrics](#)

Activities

Firefox Web Browser

huhti 10 04:27

Prometheus Time Series

Andreys Dashboard - Grafana

127.0.0.1:3000/d/M3reSFU7z/andreys-dashboard?orgId=1&refresh=1m

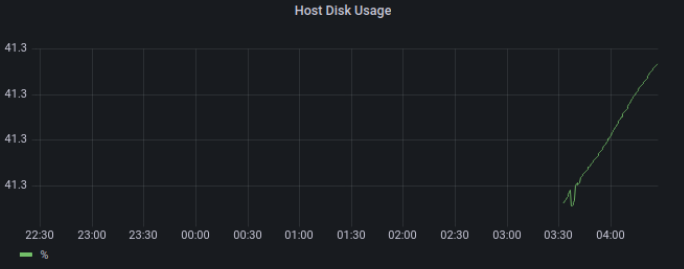
90%

General / Andreys Dashboard

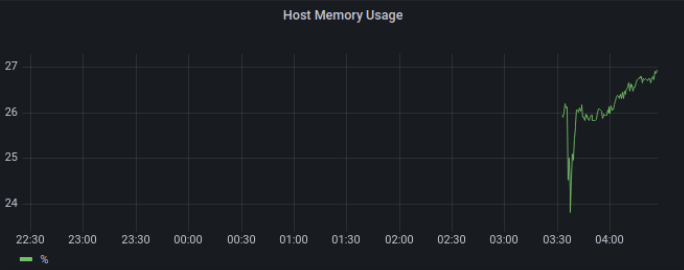
Last 6 hours

1m

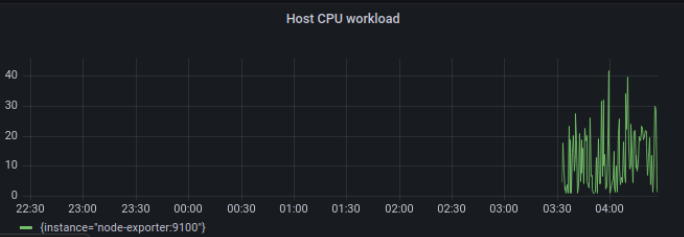
Host Disk Usage



Host Memory Usage



Host CPU workload



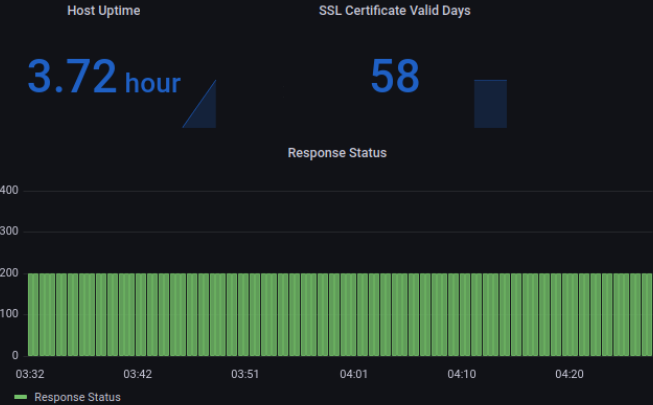
Host Uptime

3.72 hour


SSL Certificate Valid Days

58

Response Status



Response Delay



Show Applications