

САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ  
ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ  
ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ,  
МЕХАНИКИ И ОПТИКИ ФАКУЛЬТЕТ  
ИНФОКОММУНИКАЦИОННЫХ  
ТЕХНОЛОГИЙ

Отчет  
по курсу «Администрирование компьютерных сетей»  
Лабораторная 1

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Санкт-Петербург  
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# 1 Логирование

Создаем docker-compose.yml для проекта, запускаем контейнеры:

```
base ~/itmo/adm/lab1 (6.874s)
nano docker-compose.yml
base ~/itmo/adm/lab1 (3m 56.95s)
docker-compose up -d

[+] Running 76/17
  ✓ nextcloud Pulled                                234.7s
  ✓ postgres-zabbix Pulled                          214.0s
  ✓ loki Pulled                                      176.3s
  ✓ grafana Pulled                                  36.1s
  ✓ zabbix-server Pulled                            84.6s
  ✓ zabbix-web-nginx-pgsql Pulled                   66.1s
  ✓ promtail Pulled                                 68.8s

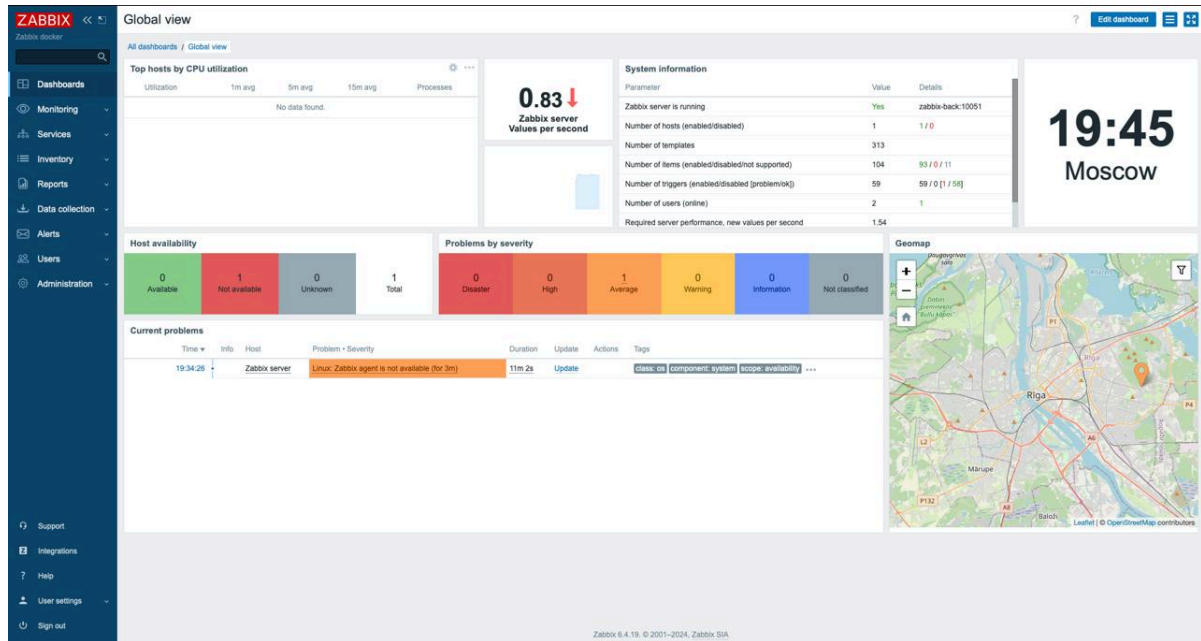
[+] Running 10/10
  ✓ Network lab1_default                            0.0s
  ✓ Volume "lab1_nc-data"                           0.0s
  ✓ Volume "lab1_zabbix-db"                         0.0s
  ✓ Container promtail                               1.3s
  ✓ Container nextcloud                             1.4s
  ✓ Container postgres-zabbix                       1.4s
  ✓ Container loki                                   1.2s
  ✓ Container grafana                               1.4s
  ✓ Container zabbix-back                           0.7s
  ✓ Container zabbix-front                          0.7s
```

Регистрируемся на Nextcloud, переходя по localhost:8080. После создания учетки выполняем команду `docker logs promtail` в терминале. Видим, что логи ведутся: см. `/var/www/html/data/nextcloud.log`.

```
0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15
2024-10-15 19:31:49 nextcloud | 172.18.0.1 - - [15/Oct/2024:16:31:48 +0000] "GET /js/core/merged-template-prepend.js?v=23
.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15"
2024-10-15 19:31:49 nextcloud | 172.18.0.1 - - [15/Oct/2024:16:31:48 +0000] "GET /dist/core-common.js?v=236af855-0 HTTP/1.1" 200 1068098 "-" Mozilla/5.0 (Macintos
h; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15"
2024-10-15 19:31:49 nextcloud | 172.18.0.1 - - [15/Oct/2024:16:31:49 +0000] "GET /apps/theming/theme/light.css?plain=0&v=67c9385c HTTP/1.1" 200 1979 "-" Mozilla/5
.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15"
2024-10-15 19:31:49 nextcloud | 172.18.0.1 - - [15/Oct/2024:16:31:49 +0000] "GET /apps/theming/theme/dark.css?plain=0&v=67c9385c HTTP/1.1" 200 1967 "-" Mozilla/5.
0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15"
2024-10-15 19:31:49 nextcloud | 172.18.0.1 - - [15/Oct/2024:16:31:49 +0000] "GET /apps/theming/theme/dark-highcontrast.css?plain=0&v=67c9385c HTTP/1.1" 200 2062 "-"
Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15"
2024-10-15 19:29:19 promtail | level=info ts=2024-10-15T16:29:19.836511463Z caller=main.go:174 msg="Starting Promtail" version="(version=2.9.0, branch=HEAD, revis
ion=2feb64f69)"
2024-10-15 19:29:19 promtail | level=warn ts=2024-10-15T16:29:19.836986463Z caller=promtail.go:263 msg="enable watchConfig"
2024-10-15 19:29:24 promtail | level=info ts=2024-10-15T16:29:24.848838132Z caller=filetargetmanager.go:361 msg="Adding target" key="/opt/nc_data/*.log:{job=\"nex
tcloud_logs\"}"
2024-10-15 19:31:24 promtail | level=info ts=2024-10-15T16:31:24.850950799Z caller=filetarget.go:313 msg="watching new directory" directory=/opt/nc_data
2024-10-15 19:31:24 promtail | level=info ts=2024-10-15T16:31:24.853562591Z caller=tailer.go:145 component=tailer msg="tail routine: started" path=/opt/nc_data/ne
xtcloud.log
2024-10-15 19:31:24 promtail | ts=2024-10-15T16:31:24.853763632Z caller=log.go:168 level=info msg="Seeked /opt/nc_data/nextcloud.log - &{Offset:0 Whence:0}"
2024-10-15 19:31:41 promtail | level=info ts=2024-10-15T16:31:41.623771376Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ht
accesstest.txt op=CREATE
2024-10-15 19:31:41 promtail | level=info ts=2024-10-15T16:31:41.631882293Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ow
ncloud.db op=CREATE
2024-10-15 19:31:41 promtail | level=info ts=2024-10-15T16:31:41.634563043Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ow
ncloud.db-journal op=CREATE
2024-10-15 19:29:51 zabbix-back | ** Updating '/etc/zabbix/zabbix_server.conf' parameter "VaultTLSKeyFile": ''...removed
2024-10-15 19:29:51 zabbix-back | ** Updating '/etc/zabbix/zabbix_server.conf' parameter "VaultURL": ''...removed
2024-10-15 19:29:51 zabbix-back | ** Updating '/etc/zabbix/zabbix_server.conf' parameter "VaultDBPath": ''...removed
2024-10-15 19:29:51 zabbix-back | ** Updating '/etc/zabbix/zabbix_server.conf' parameter "DBUser": 'zabbix'...updated
2024-10-15 19:31:41 promtail | level=info ts=2024-10-15T16:31:41.638329626Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ow
ncloud.db-wal op=CREATE
2024-10-15 19:29:51 zabbix-back | ** Updating '/etc/zabbix/zabbix_server.conf' parameter "DBPassword": '*****'. Enable DEBUG_MODE to view value ...added
2024-10-15 19:31:41 promtail | level=info ts=2024-10-15T16:31:41.638365081Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ow
ncloud.db-shm op=CREATE
2024-10-15 19:31:43 promtail | level=info ts=2024-10-15T16:31:42.989945918Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/.o
cdata op=CREATE
2024-10-15 19:31:43 promtail | level=info ts=2024-10-15T16:31:43.333731919Z caller=filetargetmanager.go:181 msg="received file watcher event" name=/opt/nc_data/ss
e@itmo.ru op=CREATE
```

## 2 Мониторинг

Начинаем работу с Zabbix: создаем шаблонный файл для мониторинга template.yml, создаем учетку на localhost:8082, импортируем шаблон. Приступим к настройке:



Разрешаем обращение Nextcloud по короткому имени из контейнера Zabbix:

```
base ~/ltmo/adm/lab1
docker exec -u www-data -it nextcloud bash
www-data@3cc6eb32dc62:~/html$ php occ config:system:set trusted_domains 1 --value="nextcloud"
System config value trusted_domains => 1 set to string nextcloud
www-data@3cc6eb32dc62:~/html$
```

Создаем хост в Zabbix:

The screenshot shows the 'New host' configuration form in Zabbix. The form is divided into several tabs: Host, IPMI, Tags, Macros, Inventory, Encryption, and Value mapping. The 'Host' tab is active, and the following fields are visible:

- Host name:** nextcloud
- Visible name:** nextcloud server
- Templates:** Test ping template (selected)
- Host groups:** Applications (selected)
- Interfaces:** No interfaces are defined. (Add button)
- Description:** (Empty text area)
- Monitored by proxy:** (no proxy) (dropdown menu)
- Enabled:** ☒

At the bottom right, there are 'Add' and 'Cancel' buttons.


Результат мониторинга:

<input type="checkbox"/> Host	Name ▲	Last check	Last value	Change	Tags	Info
<input type="checkbox"/> nextcloud server	Nextcloud: ping service	25s	healthy			<a href="#">History</a>

Displaying 1 of 1 found

### 3 Визуализация

Устанавливаем плагин Grafana для визуализации, добавляем Loki, Zabbix как источники данных:

**Zabbix**

Version 4.5.5 From Alexander Zobnin Dependencies Grafana >=9.3.0 Signature Signed Level: Grafana Labs Signed by: Grafana Labs

[Uninstall](#) [Disable](#)

Zabbix plugin for Grafana

[GitHub](#) | [Docs](#) | [License](#)

You do not have permission to uninstall this plugin.

[Overview](#) [Version history](#)

#### Zabbix plugin for Grafana

✓ Data source successfully connected.

Next, you can start to visualize data by [building a dashboard](#), or by querying data in the [Explore view](#).

✓ Zabbix API version: 6.4.19

Next, you can start to visualize data by [building a dashboard](#), or by querying data in the [Explore view](#).

Переходим во вкладку *Explore*:

Click start your query

Label browser

Explain query

Label filters

Select label 🔍

=

Select value ▾

×

+

filename

⊙ ×

+ Operations

job

text to find

+

> Options

Type: Range

Полученные логи:

Outline

loki

Queries

Logs

Kick start your query

Label browser

Explain query

Label filters

job = nextcloud\_logs

Line contains

Text to find

{job="nextcloud\_logs"} |< "

"

Options


Type: Range

Line limit: 1000

+ Add query

Query Inspector

Logs volume



logs Total: 5

Logs

Time Unique labels Wrap lines Pretty JSON Deduplication None Exact Numbers Signature

Display results Newest first Oldest first

Common labels: job=nextcloud\_logs Line limit: 1000 (5 displayed) Total bytes processed: 2.11 kB

> 2024-10-15 19:31:41.748 ("reqId":"01UJYhltchoed8FD0g7i","level":2,"time":"2024-10-15T16:31:41+08:00","remoteAddr":"172.18.0.1","user":"","app":"no app in context","method":"POST","url":"/","message":"Host localhost was not connected to because it violates local access rules","userAgent":"Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15","version":"","data":{}))

> 2024-10-15 19:31:41.748 ("reqId":"01UJYhltchoed8FD0g7i","level":2,"time":"2024-10-15T16:31:41+08:00","remoteAddr":"172.18.0.1","user":"","app":"no app in context","method":"POST","url":"/","message":"Host localhost was not connected to because it violates local access rules","userAgent":"Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15","version":"","data":{}))

> 2024-10-15 19:31:24.856 ("reqId":"81fC2zVgQBM3KqJpRk","level":3,"time":"2024-10-15T16:31:16+08:00","remoteAddr":"172.18.0.1","user":"","app":"PHP","method":"GET","url":"/","message":"fopen(/var/www/html/config/config.php): Failed to open stream: No such file or directory at /var/www/html/lib/private/Config/Config.php#221","userAgent":"Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15","version":"","data":{"app":"PHP"}})

> 2024-10-15 19:31:24.856 ("reqId":"81fC2zVgQBM3KqJpRk","level":2,"time":"2024-10-15T16:31:16+08:00","remoteAddr":"172.18.0.1","user":"","app":"no app in context","method":"GET","url":"/","message":"Host localhost was not connected to because it violates local access rules","userAgent":"Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15","version":"","data":{}))

> 2024-10-15 19:31:24.856 ("reqId":"81fC2zVgQBM3KqJpRk","level":2,"time":"2024-10-15T16:31:16+08:00","remoteAddr":"172.18.0.1","user":"","app":"no app in context","method":"GET","url":"/","message":"Host localhost was not connected to because it violates local access rules","userAgent":"Mozilla/5.0 (Macintosh; Intel Mac OS X 10\_15\_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.4.1 Safari/605.1.15","version":"","data":{}))

Результат для Zabbix, выставление всех фильтров:

Outline

alexanderzobnin-zabbix-datasou

Queries

Table

Query type

Text

Group

Applications

Host

nextcloud server

Application

Item

Nextcloud: ping service

Text filter

Use capture groups

Options

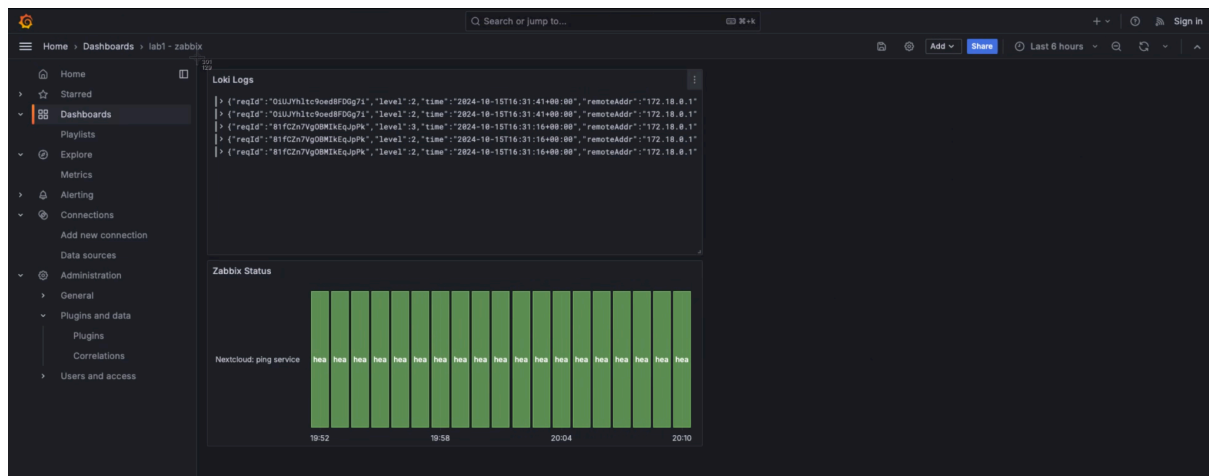
+ Add query

Query Inspector

Table - Nextcloud: ping service

Time	Nextcloud: ping service
2024-10-15 19:52:31	healthy
2024-10-15 19:53:31	healthy
2024-10-15 19:54:31	healthy
2024-10-15 19:55:31	healthy
2024-10-15 19:56:31	healthy
2024-10-15 19:57:31	healthy
2024-10-15 19:58:31	healthy

Итоговые дашборды с использованием датасурсов Zabbix и Loki (таблица с логами):



## 4 Ответы на вопросы к ЛР

*Чем SLO отличается от SLA?*

- SLO - это целевое значение количественной оценки работы, связанной предоставлением услуги (SLI). SLA - формальный договор между заказчиком услуги и её поставщиком, содержащий описание услуги, права и обязанности сторон и согласованный уровень качества предоставления данной услуги. SLO может входить в SLI как цель, ожидаемый уровень качества.

*Чем отличается инкрементальный бэкап от дифференциального?*

- При инкрементном копировании происходит копирование внесенных изменений с момента последнего бэкапа, при дифференциальном копируются изменения, внесенные с момента последнего полного бэкапа. Инкрементное копирование происходит быстрее и затрачивает меньше памяти, но при восстановлении данных понадобятся все созданные копии изменений и изначальный бэкап, в то время как при использовании дифференциального копирования нужны первый полный бэкап и последняя созданная копия изменений.

*В чем разница между мониторингом и observability?*

- Мониторинг - сбор данных о работе (что за ошибка произошла, где она произошла), в то время как observability - изучение полученных данных о работе (почему ошибка произошла, как произошла).