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ДИСЦИПЛИНА: «Распределенные системы»

Отчет по практической работе №3

Тема:

«Message queue»

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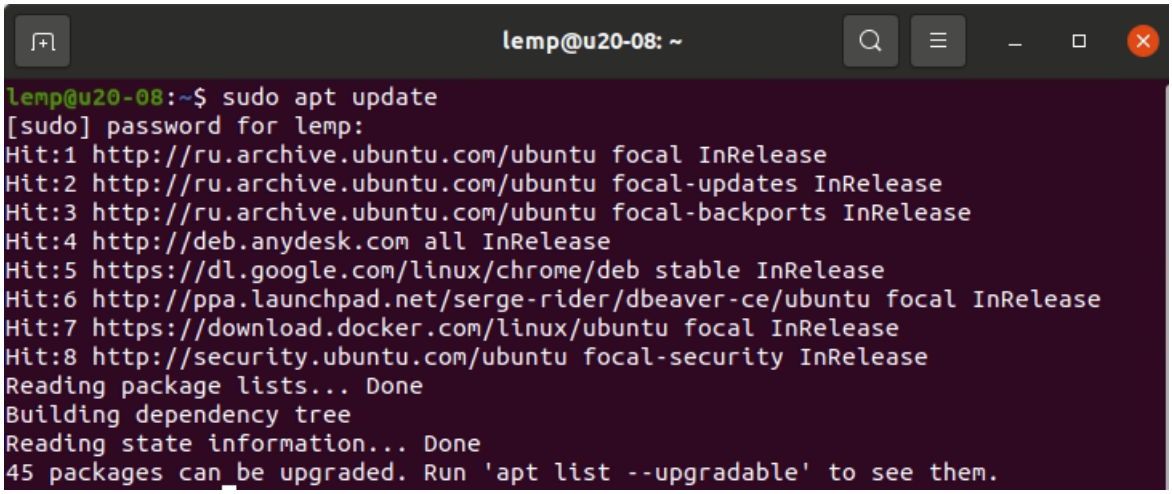
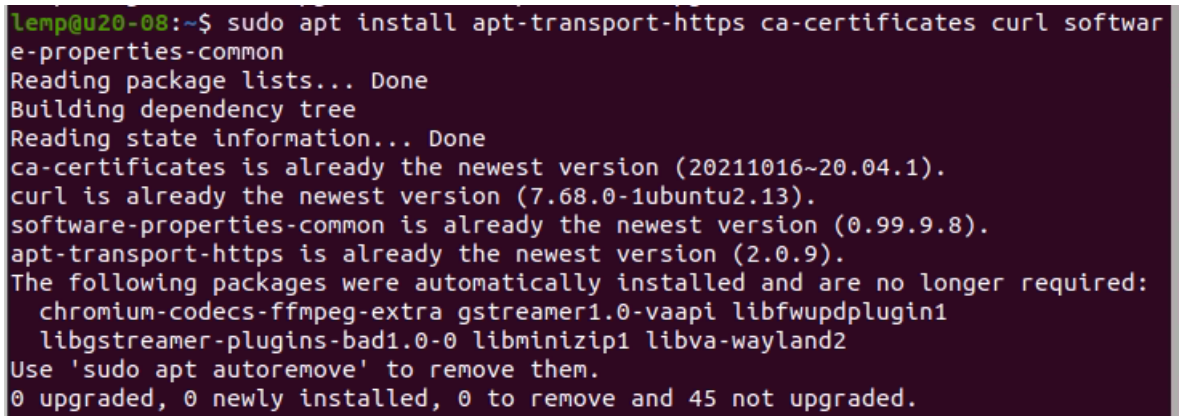
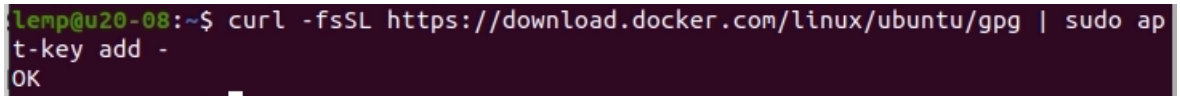
Проведение индексации изменений.



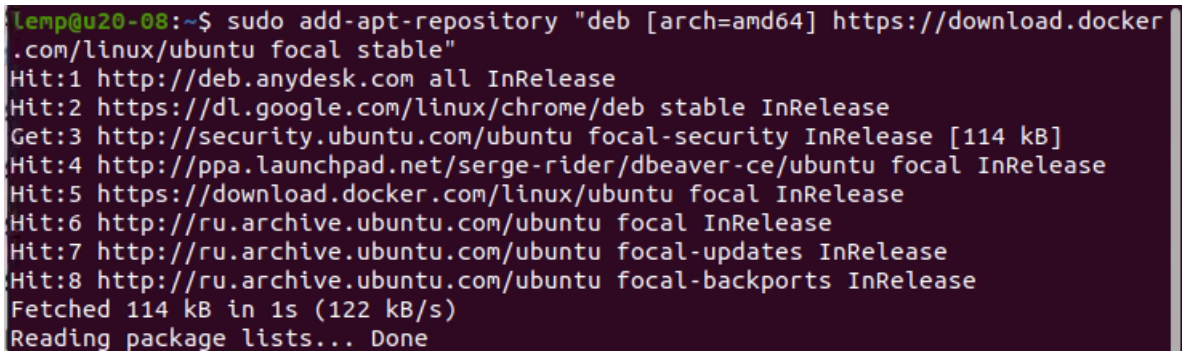
Установка curl.



Создание каталога для докера.



Добавление репозитория для скачивания образов.



Проведение индексации изменений.

```
lemp@u20-08:~$ sudo apt update
Hit:1 http://ru.archive.ubuntu.com/ubuntu focal InRelease
Hit:2 http://ru.archive.ubuntu.com/ubuntu focal-updates InRelease
Hit:3 http://ru.archive.ubuntu.com/ubuntu focal-backports InRelease
Hit:4 http://deb.anydesk.com all InRelease
Hit:5 https://dl.google.com/linux/chrome/deb stable InRelease
Get:6 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:7 http://ppa.launchpad.net/serge-rider/dbeaver-ce/ubuntu focal InRelease
Hit:8 https://download.docker.com/linux/ubuntu focal InRelease
Fetched 114 kB in 1s (133 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
45 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

Добавление компонента докера в систему.

Просмотр пакетов версий.

```
lemp@u20-08:~$ apt-cache policy docker-ce
docker-ce:
  Installed: 5:20.10.17~3-0~ubuntu-focal
  Candidate: 5:20.10.18~3-0~ubuntu-focal
  Version table:
     5:20.10.18~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
 *** 5:20.10.17~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
        100 /var/lib/dpkg/status
     5:20.10.16~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.15~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.14~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.13~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.12~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.11~3-0~ubuntu-focal 500
        500 https://download.docker.com/linux/ubuntu focal/stable amd64 Packages
     5:20.10.10~3-0~ubuntu-focal 500
```

Установка стабильной версии докера.

```
lemp@u20-08:~$ sudo apt install docker-ce
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi libfwupdplugin1 '·
  libgstreamer-plugins-bad1.0-0 libminizip1 libva-wayland2
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
The following packages will be upgraded:
  docker-ce
1 upgraded, 0 newly installed, 0 to remove and 44 not upgraded.
Need to get 20,4 MB of archives.
After this operation, 12,4 MB disk space will be freed.
Get:1 https://download.docker.com/linux/ubuntu focal/stable amd64 docker-ce amd6
4 5:20.10.18~3-0~ubuntu-focal [20,4 MB]
Fetched 20,4 MB in 2s (9 586 kB/s)
(Reading database ... 181908 files and directories currently installed.)
Preparing to unpack .../docker-ce_5%3a20.10.18~3-0~ubuntu-focal_amd64.deb ...
Unpacking docker-ce (5:20.10.18~3-0~ubuntu-focal) over (5:20.10.17~3-0~ubuntu-fo
cal) ...
Setting up docker-ce (5:20.10.18~3-0~ubuntu-focal) ...
Processing triggers for systemd (245.4-4ubuntu3.17) ...
```

Проверка работы докера.

```
lemp@u20-08: ~
lemp@u20-08:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
     Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset>
     Active: active (running) since Tue 2022-09-27 09:26:37 MSK; 49s ago
TriggeredBy: ● docker.socket                    )1 libva-wayland2
       Docs: https://docs.docker.com
   Main PID: 82305 (dockerd)
      Tasks: 12
     Memory: 24.6M
     CGroup: /system.slice/docker.service
             └─82305 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/con>

сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.638225642+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.638240642+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.638246642+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.638378345+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.820431838+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.863074579+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.911597937+03:0>
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.911645338+03:0>
сен 27 09:26:37 u20-08 systemd[1]: Started Docker Application Container Engine.
сен 27 09:26:37 u20-08 dockerd[82305]: time="2022-09-27T09:26:37.933896777+03:0>
lines 1-21/21 (END)
```

Скачивание докер-композера с помощью curl.

```
lemp@u20-08:~$ sudo curl -L "https://github.com/docker/compose/releases/download
/1.25.0/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
[sudo] password for lemp:
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 16.2M  100 16.2M    0     0  19.7M      0 --:--:-- --:--:-- --:--:-- 19.7M
```

Предоставление полным доступом для работы с сервисом.

Проверка работы композера.

```
lemp@u20-08:~$ sudo chmod +x /usr/local/bin/docker-compose
lemp@u20-08:~$ docker-compose --version
docker-compose version 1.25.0, build 0a186604
```

Проверка сборок для запуска.

```
lemp@u20-08:~$ docker-compose ps
ERROR:
        Can't find a suitable configuration file in this directory or any
        parent. Are you in the right directory?

        Supported filenames: docker-compose.yml, docker-compose.yaml
```

Запуск RabbitMQ в Docker контейнере (2 вариант).

Скачивание образа RabbitMQ.

```
lemp@u20-08:~$ sudo docker pull rabbitmq:3.6.14-management
[sudo] password for lemp:
3.6.14-management: Pulling from library/rabbitmq
e7bb522d92ff: Pull complete
ad90649c4d84: Pull complete
5a318b914d6c: Pull complete
cedd60f70052: Pull complete
f754361b064d: Pull complete
9024d880d342: Pull complete
b3d775050fc8: Pull complete
6e9f52fff670: Pull complete
2af9c86e1071: Pull complete
80eef1b61d37: Pull complete
82f0271a3b5e: Pull complete
c6f959a3f62b: Pull complete
a289a4ffa099: Pull complete
Digest: sha256:8f4d1feacc3f160a8e426dd33c57b7147c8e863d6283e917e3ce5f790830cca3
Status: Downloaded newer image for rabbitmq:3.6.14-management
docker.io/library/rabbitmq:3.6.14-management
```

Создание раздела (volume) для хранения логов инцидентов.

```
lemp@u20-08:~$ sudo docker volume create rabbitmq_data
rabbitmq_data
```

Запуск контейнера с RabbitMQ.

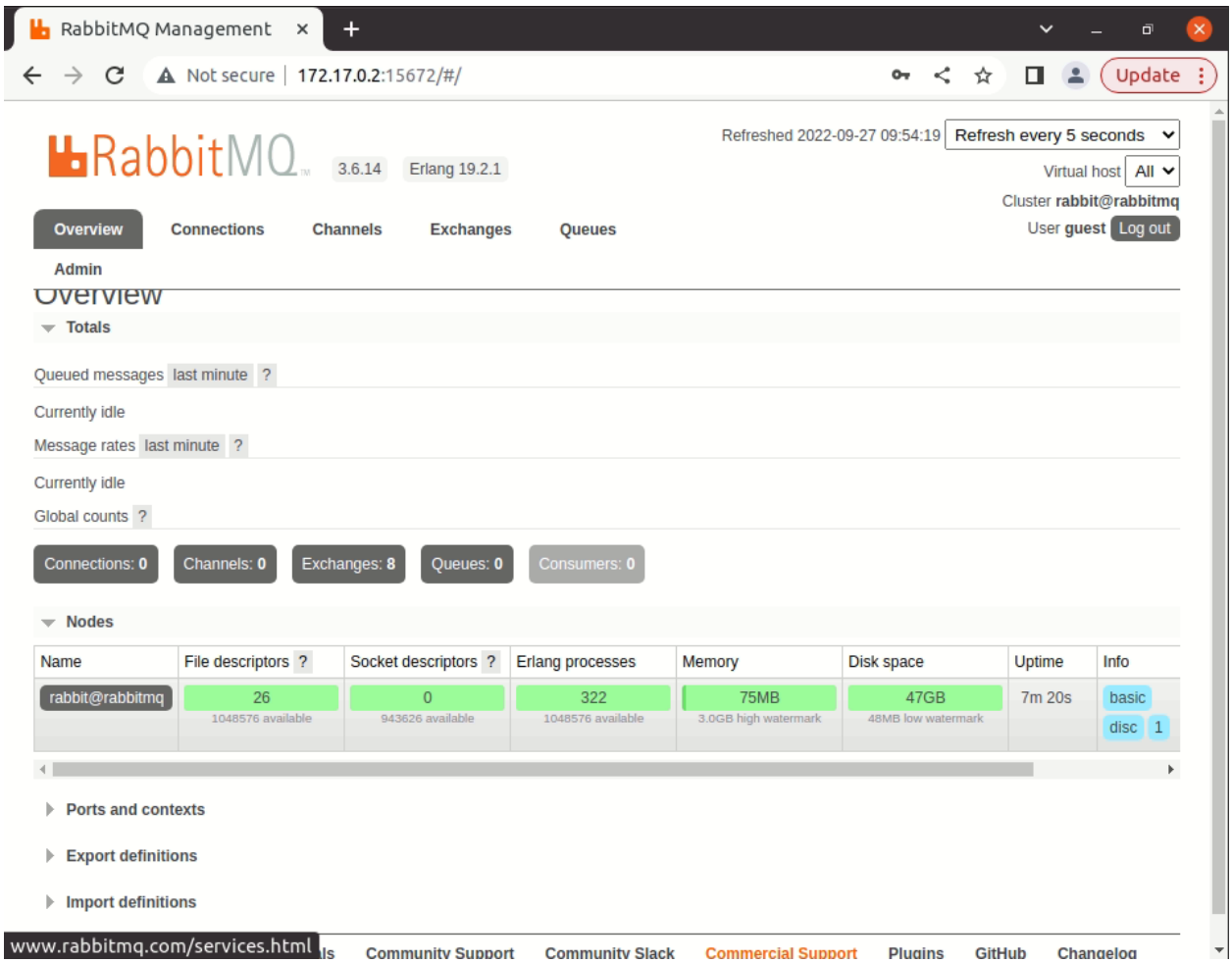
```
lemp@u20-08:~$ sudo docker run -d --hostname rabbitmq --log-driver=journald --na
me rabbitmq -p 5672:5672 -p 15672:15672 -p 15674:15674 -p 25672:25672 -p 61613:6
1613 -v rabbitmq_data:/var/lib/rabbitmq rabbitmq:3.6.14-management
c5765fef4346dd7b20a3bce5e138b6c9c9fe50de30dea13e870da0bc50fa51fc
```

Проверка контейнера.

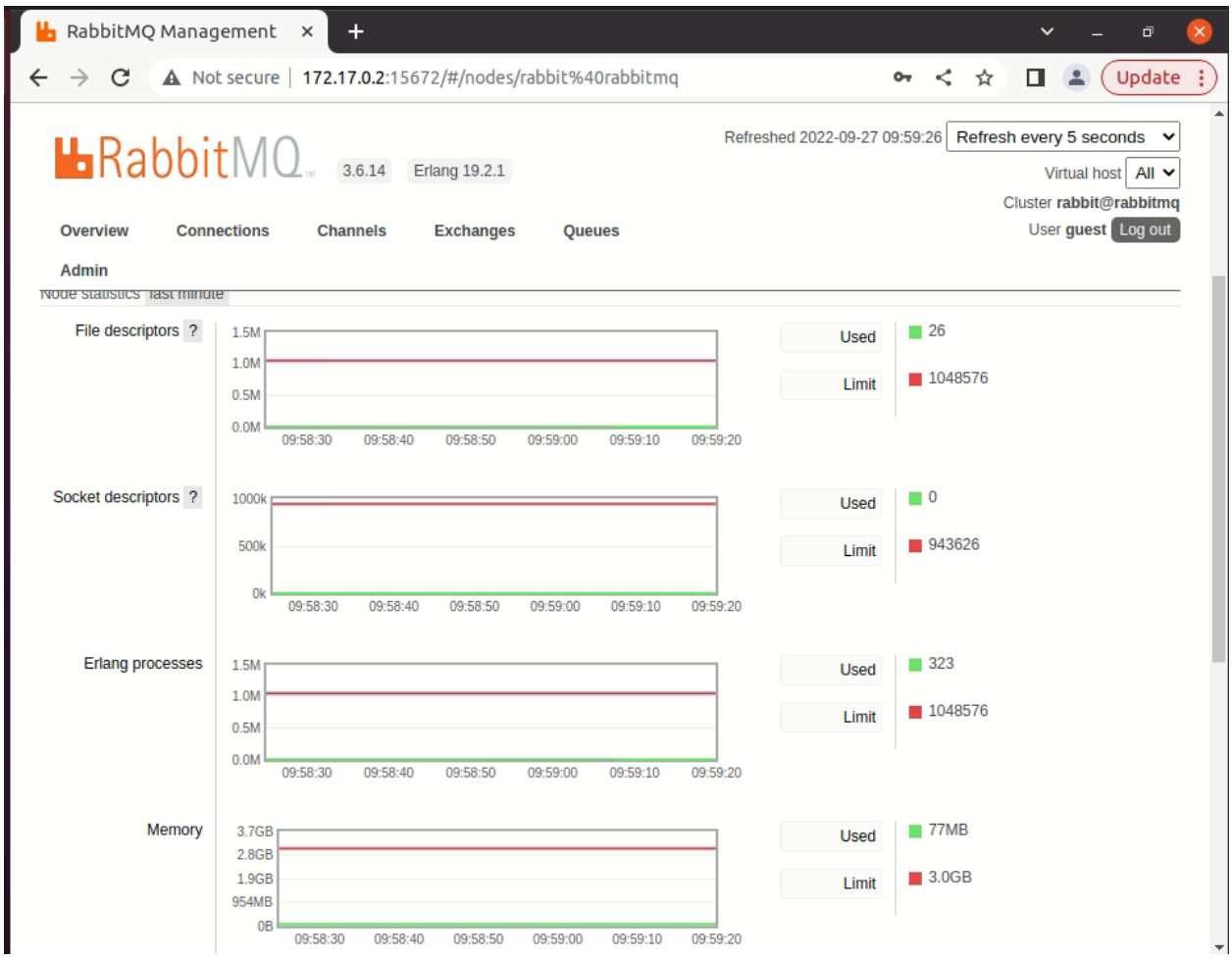
```
lemp@u20-08:~$ sudo docker container inspect rabbitmq
[
    {
        "Id": "c5765fef4346dd7b20a3bce5e138b6c9c9fe50de30dea13e870da0bc50fa51fc"
,
        "Created": "2022-09-27T06:46:49.536930205Z",
        "Path": "docker-entrypoint.sh",
        "Args": [
            "rabbitmq-server"
        ],
        "State": {
            "Status": "running",
            "Running": true,
            "Paused": false,
            "Restarting": false,
            "OOMKilled": false,
            "Dead": false,
            "Pid": 83136,
            "ExitCode": 0,
            "Error": "",
            "StartedAt": "2022-09-27T06:46:50.310996116Z",
            "FinishedAt": "0001-01-01T00:00:00Z"
        },
```

```
            "Networks": {
                "bridge": {
                    "IPAMConfig": null,
                    "Links": null,
                    "Aliases": null,
                    "NetworkID": "449592032afad6c105f2079ca8fcb6e2ffa49c610c8b96
375c52ac111ffb1c22",
                    "EndpointID": "065d692ede1ea8a52f64c1a6cf41c2311b86a67f6e990
3437026dd13b4d0a70e",
                    "Gateway": "172.17.0.1",
                    "IPAddress": "172.17.0.2",
                    "IPPrefixLen": 16,
                    "IPv6Gateway": "",
                    "GlobalIPv6Address": "",
                    "GlobalIPv6PrefixLen": 0,
                    "MacAddress": "02:42:ac:11:00:02",
                    "DriverOpts": null
                }
            }
        }
    }
]
```

Запуск RabbitMQ.



В данный момент перехват отсутствует.



Проверка контейнеров.

```
lemp@u20-08:~$ sudo docker ps -a
[sudo] password for lemp:
CONTAINER ID   IMAGE                                COMMAND                  CREATED          STATUS
                   PORTS

                                                                           NAMES
c5765fef4346   rabbitmq:3.6.14-management           "docker-entrypoint.s…"   17 minutes ago   Up 17 min
utes               4369/tcp, 5671/tcp, 0.0.0.0:5672->5672/tcp, :::5672->5672/tcp, 0.0.0.0:15672->15672/t
cp, :::15672->15672/tcp, 0.0.0.0:15674->15674/tcp, :::15674->15674/tcp, 0.0.0.0:25672->25672/tcp, :::256
72->25672/tcp, 15671/tcp, 0.0.0.0:61613->61613/tcp, :::61613->61613/tcp   rabbitmq
d268645c2e0c   marcelmittelstaedt/hive_base:latest   "/startup.sh"            2 months ago     Exited (2
55) 3 weeks ago    0.0.0.0:8088->8088/tcp, :::8088->8088/tcp, 0.0.0.0:9870->9870/tcp, :::9870->9870/tcp,
 0.0.0.0:49153->9864/tcp, :::49153->9864/tcp
                                                                           hive_base_container
5a9cbc1b4b8f   bitnami/cassandra:4.0                "/opt/bitnami/script…"   5 months ago     Exited (2
55) 4 months ago   0.0.0.0:7000->7000/tcp, :::7000->7000/tcp, 0.0.0.0:9042->9042/tcp, :::9042->9042/tcp

                                                                           frolov_cassandra_1
7b89ab880778   phpmyadmin/phpmyadmin:5.0.0          "/docker-entrypoint.…"   7 months ago     Exited (0
) 7 months ago

                                                                           phpmyadmin2
4c8b07626b08   mysql:latest                         "docker-entrypoint.s…"   7 months ago     Exited (0
) 7 months ago

                                                                           mysql2
c142308fc761   phpmyadmin/phpmyadmin:5.0.0          "/docker-entrypoint.…"   7 months ago     Exited (0
) 7 months ago

                                                                           phpmyadmin
1aec8dd4c7ff   mysql:latest                         "docker-entrypoint.s…"   7 months ago     Exited (0
) 7 months ago

                                                                           mysql
```

Удаление контейнеров.

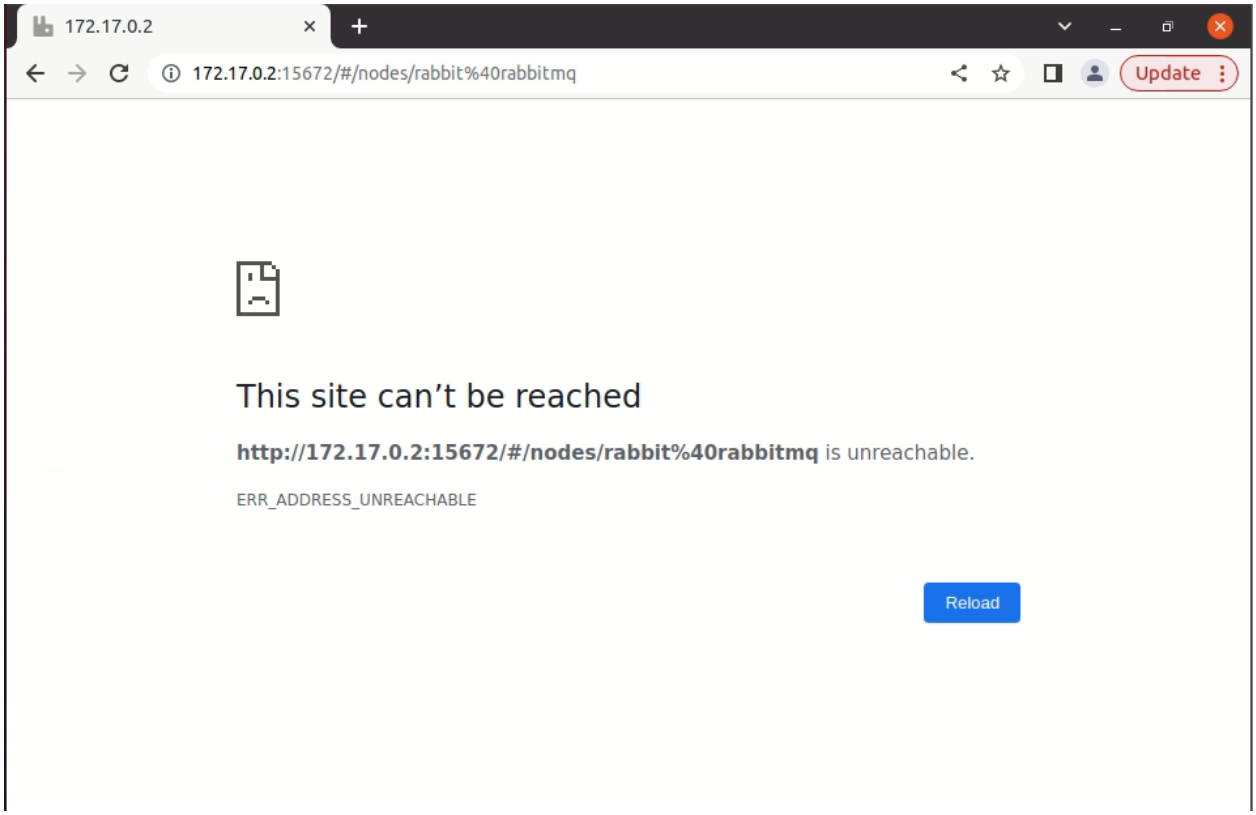
```
lemp@u20-08:~$ sudo docker stop frolov_cassandra_1
frolov_cassandra_1
lemp@u20-08:~$ sudo docker rm 5a9cbc1b4b8f
5a9cbc1b4b8f
lemp@u20-08:~$ sudo docker stop phpmyadmin2
phpmyadmin2
lemp@u20-08:~$ sudo docker rm 7b89ab880778
7b89ab880778
lemp@u20-08:~$ sudo docker stop mysql2
mysql2
lemp@u20-08:~$ sudo docker rm 4c8b07626b08
4c8b07626b08
lemp@u20-08:~$ sudo docker stop phpmyadmin
phpmyadmin
lemp@u20-08:~$ sudo docker rm c142308fc761
c142308fc761
lemp@u20-08:~$ sudo docker stop mysql
mysql
lemp@u20-08:~$ sudo docker rm 1aec8dd4c7ff
1aec8dd4c7ff
lemp@u20-08:~$ sudo docker ps -a
CONTAINER ID   IMAGE                          COMMAND                  CREATED          STATUS          PO
RTS

                                                                        NAMES
c5765fef4346   rabbitmq:3.6.14-management   "docker-entrypoint.s…"   24 minutes ago   Up 24 minutes   43
69/tcp, 5671/tcp, 0.0.0.0:5672->5672/tcp, :::5672->5672/tcp, 0.0.0.0:15672->15672/tcp, :::15672->15672/t
cp, 0.0.0.0:15674->15674/tcp, :::15674->15674/tcp, 0.0.0.0:25672->25672/tcp, :::25672->25672/tcp, 15671/
tcp, 0.0.0.0:61613->61613/tcp, :::61613->61613/tcp   rabbitmq
lemp@u20-08:~$
```

Пример перехвата сообщений представлен ниже, после переустановки RabbitMQ.

Остановка и удаление брокера.

```
lemp@u20-08:~$ sudo docker stop rabbitmq
rabbitmq
```



```
lemp@u20-08:~$ sudo docker rm rabbitmq
rabbitmq
lemp@u20-08:~$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
```

Запуск RabbitMQ в Docker контейнере (1 вариант).

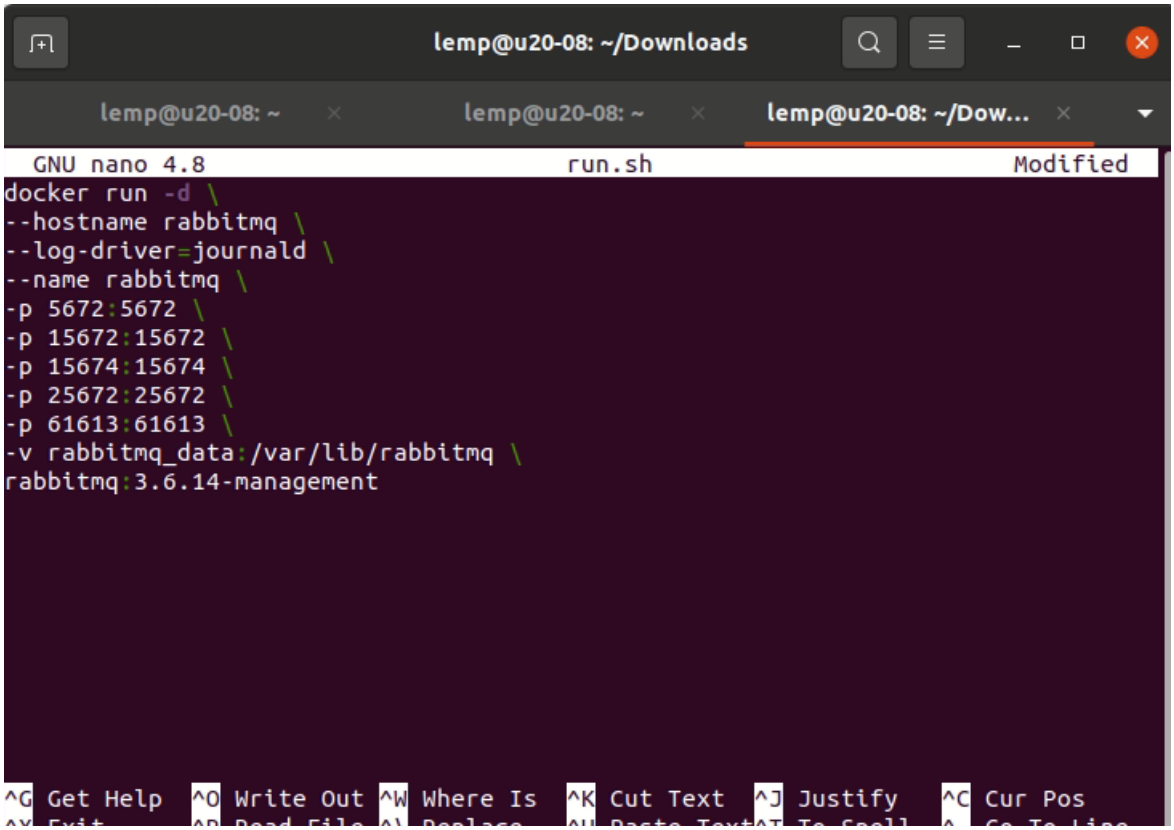
Создание файла run.sh

```
lemp@u20-08:~$ touch run.sh
```

Определение прав на запуск.

```
lemp@u20-08:~/Downloads$ sudo chmod +x run.sh
[sudo] password for lemp:
```

Редактирование файла, запись скрипта.

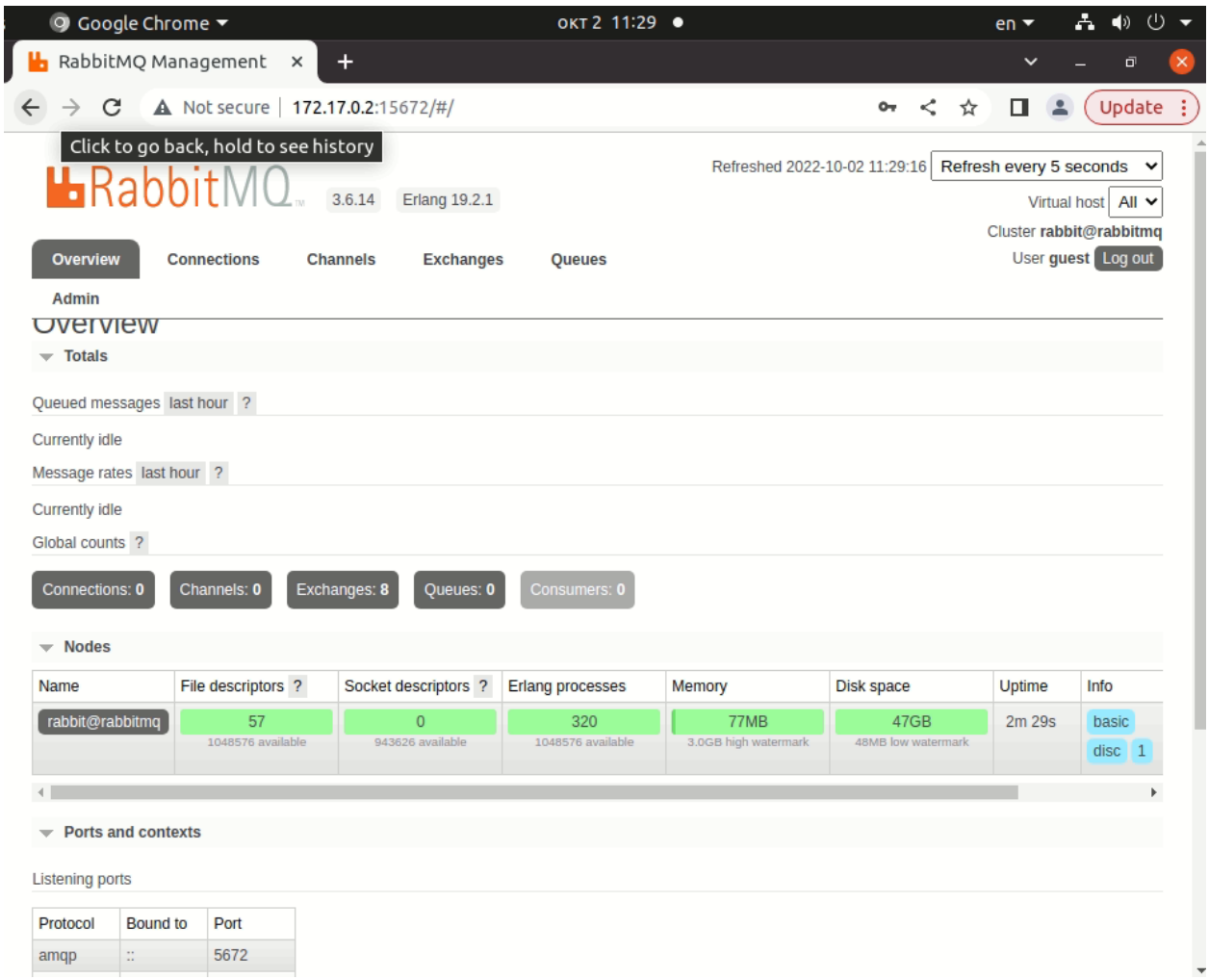


Запуск скрипта.

```
lemp@u20-08:~/Downloads$ nano run.sh
lemp@u20-08:~/Downloads$ sudo sh run.sh
da35cc108a884bd1082570b25cbb78aa8ac141914d89fc02974dccb1cb22376c
lemp@u20-08:~/Downloads$ sudo docker volume create rabbitmq_data
rabbitmq_data
```

Проверка наличия контейнера брокера.

```
lemp@u20-08:~$ sudo docker ps -a
CONTAINER ID   IMAGE                     COMMAND                  CREATED         STATUS         PORTS
                                                
```



Реализация примеров.

Пример 1.

Установка pika – библиотеки Python для RabbitMQ.

Запуск receive.

```
lemp@u20-08:~/Downloads/examples$ pip3 install pika
Collecting pika
  Downloading pika-1.3.0-py3-none-any.whl (155 kB)
     |████████████████████████████████| 155 kB 2.5 MB/s
Installing collected packages: pika
Successfully installed pika-1.3.0
lemp@u20-08:~/Downloads/examples$ cd rabbitmq
lemp@u20-08:~/Downloads/examples/rabbitmq$ python3 hello-world/recieve.py
started simple reciever
[producer] Waiting for messages.
```

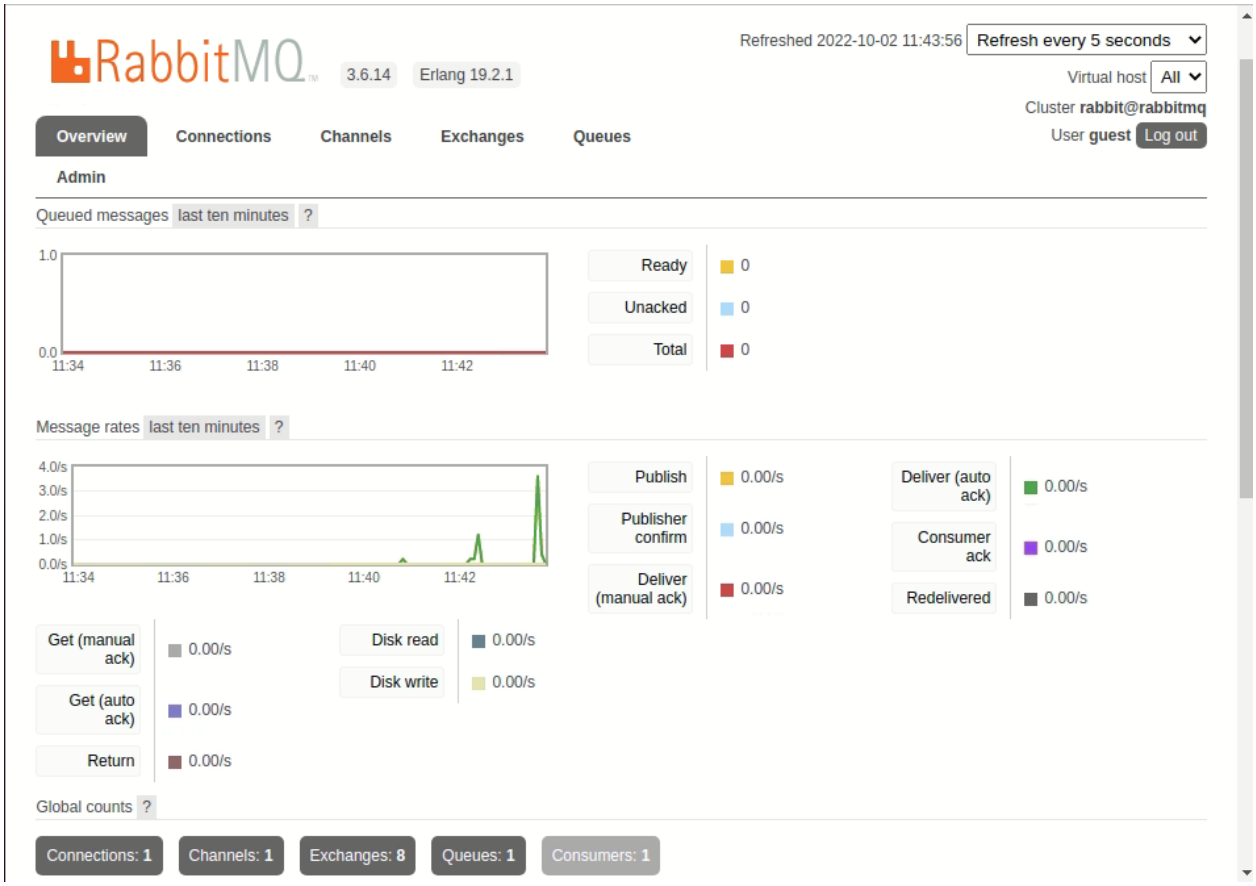
Запуск send.

```
lemp@u20-08:~/Downloads/examples/rabbitmq$ python3 hello-world/send.py
enter message >>> hello
[sender] Sent hello to queue default on host localhost
enter message >>> hello
[sender] Sent hello to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> h
[sender] Sent h to queue default on host localhost
enter message >>> h
[sender] Sent h to queue default on host localhost
```

Сообщения дошли.

```
[reciever] Received hello from channel <BlockingChannel impl=<Channel number=1
OPEN conn=<SelectConnection OPEN transport=<pika.adapters.utils.io_services_uti
ls._AsyncPlaintextTransport object at 0x7ff67af49ee0> params=<ConnectionParamet
ers host=localhost port=5672 virtual_host=/ ssl=False>>>>, method <Basic.Delive
r(['consumer_tag=ctag1.3dbbfa777a7343738dd286ae30c96f5b', 'delivery_tag=1', 'ex
change=', 'redelivered=False', 'routing_key=default'])>
[reciever] Received hello from channel <BlockingChannel impl=<Channel number=1
OPEN conn=<SelectConnection OPEN transport=<pika.adapters.utils.io_services_uti
ls._AsyncPlaintextTransport object at 0x7ff67af49ee0> params=<ConnectionParamet
ers host=localhost port=5672 virtual_host=/ ssl=False>>>>, method <Basic.Delive
r(['consumer_tag=ctag1.3dbbfa777a7343738dd286ae30c96f5b', 'delivery_tag=2', 'ex
change=', 'redelivered=False', 'routing_key=default'])>
[reciever] Received hi from channel <BlockingChannel impl=<Channel number=1 OPE
N conn=<SelectConnection OPEN transport=<pika.adapters.utils.io_services_utils.
_AsyncPlaintextTransport object at 0x7ff67af49ee0> params=<ConnectionParameters
 host=localhost port=5672 virtual_host=/ ssl=False>>>>, method <Basic.Deliver([
'consumer_tag=ctag1.3dbbfa777a7343738dd286ae30c96f5b', 'delivery_tag=3', 'excha
nge=', 'redelivered=False', 'routing_key=default'])>
[reciever] Received hi from channel <BlockingChannel impl=<Channel number=1 OPE
N conn=<SelectConnection OPEN transport=<pika.adapters.utils.io_services_utils.
```

RabbitMQ их перехватил.



Пример 2.

Запуск worker.

```
lemp@u20-08:~/Downloads/examples/rabbitmq$ python3 task-queue/worker.py
started simple worker
[worker] Waiting for messages.
```

Запуск dispatcher.

```
lemp@u20-08:~/Downloads/examples/rabbitmq$ python3 task-queue/dispatcher.py
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
enter message >>> hi
[sender] Sent hi to queue default on host localhost
```

Сообщения дошли.

```
[worker] Received command `['hi']` from channel default, method <class 'pika.sp
ec.Basic.Deliver'>
[worker] Executing command
[worker] Received command `['hi']` from channel default, method <class 'pika.sp
ec.Basic.Deliver'>
[worker] Executing command
[worker] Received command `['hi']` from channel default, method <class 'pika.sp
ec.Basic.Deliver'>
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[worker] Executing command
[worker] Received command `['hi']` from channel default, method <class 'pika.sp
ec.Basic.Deliver'>
[worker] Executing command
[worker] Received command `['hi']` from channel default, method <class 'pika.sp
```
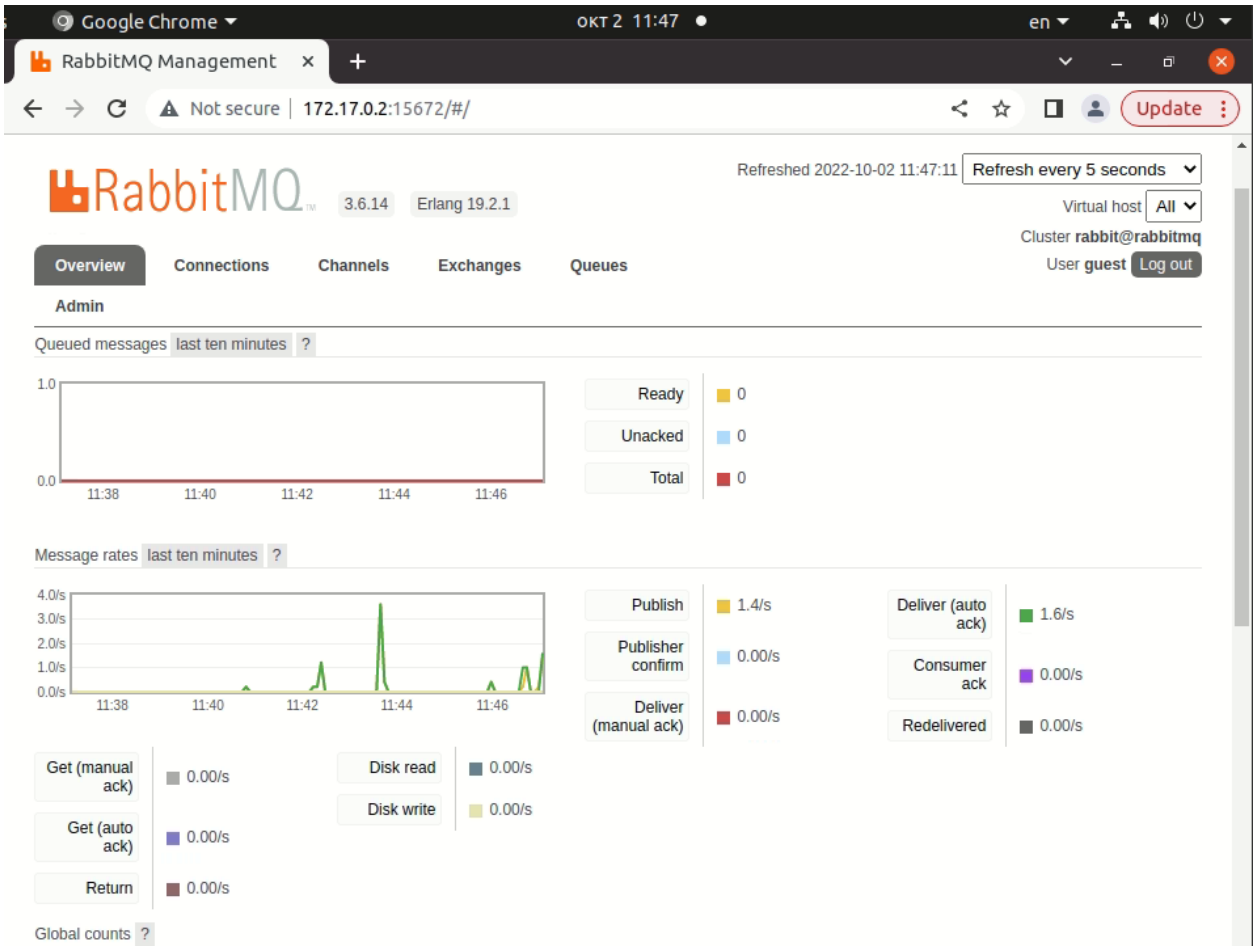
RabbitMQ их перехватил.