

Проект развернут на 4 VM, backend-api и БД PostgreSQL на Ubuntu, Прoxy и Redis на CentOS7.

Статусы сервисов в systemctl:

backend-api:

```
● backend-api.service - Backend API Service
   Loaded: loaded (/usr/lib/systemd/system/backend-api.service; enabled; preset: enabled)
   Active: active (running) since Tue 2026-02-17 14:41:05 MSK; 3h 29min ago
 Main PID: 3256 (backend-api)
    Tasks: 5 (limit: 4600)
   Memory: 1.5M (peak: 1.9M)
      CPU: 78ms
   CGroup: /system.slice/backend-api.service
           └─3256 /usr/bin/backend-api
```

PostgreSQL:

```
● postgresql.service - PostgreSQL RDBMS
   Loaded: loaded (/usr/lib/systemd/system/postgresql.service; enabled; preset: enabled)
   Active: active (exited) since Tue 2026-02-17 14:40:50 MSK; 1h 48min ago
 Process: 3686 ExecStart=/bin/true (code=exited, status=0/SUCCESS)
 Main PID: 3686 (code=exited, status=0/SUCCESS)
    CPU: 4ms

Feb 17 14:40:50 postgres systemd[1]: Starting postgresql.service - PostgreSQL RDBMS...
Feb 17 14:40:50 postgres systemd[1]: Finished postgresql.service - PostgreSQL RDBMS.
```

Proxy:

```
● proxy-api.service - Proxy API Service
   Loaded: loaded (/usr/lib/systemd/system/proxy-api.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2026-02-17 15:26:17 MSK; 1h 7min ago
 Main PID: 6662 (python3)
    Tasks: 1
   Memory: 29.0M
   CGroup: /system.slice/proxy-api.service
           └─6662 /usr/bin/python3 /usr/bin/proxy-api
```

Redis(Valkey server info):

```
redis_git_dirty:0
redis_build_id:42b4844e567e9e22
server_mode:standalone
os:Linux 3.10.0-1160.119.1.el7.x86_64 x86_64
arch_bits:64
monotonic_clock:POSIX clock_gettime
multiplexing_api:epoll
gcc_version:15.2.0
process_id:11855
process_supervised:no
run_id:9304121321021d9d8f6618635b2d0a6d7f5f6c74
tcp_port:6379
server_time_usec:1771335376122097
uptime_in_seconds:4038
uptime_in_days:0
hz:10
configured_hz:10
clients_hz:10
lru_clock:9727696
executable:/home/cent_adm/my-valkey-env/valkey-server
config_file:
io_threads_active:0
availability_zone:
listener0:name=tcp,bind=0.0.0.0,port=6379
127.0.0.1:6379>
[0] 0:bash*
```

Настройки доступа к БД в pg\_hba:

```
host    all             all             192.168.1.46/32             scram-sha-256
```

Логи работы сервисов:

backend-api:

```
фев 17 14:41:05 backend-api systemd[1]: Started backend-api.service - Backend API Service.  
фев 17 14:41:05 backend-api backend-api[3256]: 2026/02/17 14:41:05 Backend API запущен на :8080
```

PostgreSQL:

```
2026-02-17 14:40:48.578 MSK [3667] LOG:  starting PostgreSQL 16.11 (Ubuntu 16.11-0ubuntu0.24.04.1) on x86_64-pc-linux-gnu, compiled by gcc (Ubuntu 14.2.0-14ubuntu2) 64-bit  
2026-02-17 14:40:48.578 MSK [3667] LOG:  listening on IPv6 address "::1", port 5432  
2026-02-17 14:40:48.578 MSK [3667] LOG:  listening on IPv4 address "127.0.0.1", port 5432  
2026-02-17 14:40:48.582 MSK [3667] LOG:  listening on IPv4 address "192.168.1.48", port 5432  
2026-02-17 14:40:48.582 MSK [3667] LOG:  listening on Unix socket "/var/run/postgresql/.s.PGSQL.5432"  
2026-02-17 14:40:48.590 MSK [3670] LOG:  database system was shut down at 2026-02-17 14:40:48 MSK  
2026-02-17 14:40:48.597 MSK [3667] LOG:  database system is ready to accept connections  
(END)
```

Proxy:

```
Feb 17 16:07:45 proxy python3[6662]: 192.168.1.49 - - [17/Feb/2026 16:07:45] "GET /user?id=3 HTTP/1.1" 200 -  
Feb 17 16:07:54 proxy python3[6662]: 192.168.1.49 - - [17/Feb/2026 16:07:54] "GET /user?id=3 HTTP/1.1" 200 -
```

Redis(Valkey monitor):

```
1771333666.183127 [0 192.168.1.118:37400] "GET" "3"  
1771333666.193134 [0 192.168.1.118:37400] "SET" "3" "{\"id\":3,\"name\": \"Bob Johnson\", \"age\":40}\\n" "EX" "60"  
1771333675.745170 [0 192.168.1.118:37400] "GET" "3"
```

Содержание таблицы users в БД:

```
test=> select * from users;  
id | name | age | email  
-----+-----+-----+-----  
1 | John Doe | 30 | john.doe@example.com  
2 | Jane Smith | 25 | jane.smith@example.com  
3 | Bob Johnson | 40 | bob.johnson@example.com  
4 | Alice Brown | 28 | alice.brown@example.com  
5 | Charlie Davis | 35 | charlie.davis@example.com  
6 | Eva Wilson | 22 | eva.wilson@example.com  
7 | George Harris | 45 | george.harris@example.com  
8 | Linda Clark | 33 | linda.clark@example.com  
9 | Michael Lewis | 29 | michael.lewis@example.com  
10 | Sarah Young | 31 | sarah.young@example.com  
11 | David Hall | 37 | david.hall@example.com  
12 | Olivia Allen | 24 | olivia.allen@example.com  
13 | James Wright | 50 | james.wright@example.com  
14 | Emily King | 27 | emily.king@example.com  
15 | Daniel Scott | 32 | daniel.scott@example.com  
16 | Sophia Adams | 26 | sophia.adams@example.com  
17 | Matthew Baker | 39 | matthew.baker@example.com  
18 | Grace Nelson | 23 | grace.nelson@example.com  
19 | Anthony Hill | 41 | anthony.hill@example.com  
20 | Isabella Rivera | 21 | isabella.rivera@example.com  
(20 rows)
```

Результат двух одинаковых запросов с клиентской машины(ещё одна VM, но её IP не вписан в настройки сетевого взаимодействия)

```
ub_adm@UbuntuDesktop:~$ curl http://proxy:5000/user?id=3
{"cached":false,"user":{"age":40,"id":3,"name":"Bob Johnson"}}
ub_adm@UbuntuDesktop:~$ curl http://proxy:5000/user?id=3
{"cached":true,"user":{"age":40,"id":3,"name":"Bob Johnson"}}
```

Результат запроса с этой машины до IP backend-api:

```
ub_adm@UbuntuDesktop:~$ curl -v http://192.168.1.46:8080/user?id=3
* Trying 192.168.1.46:8080...
^C
ub_adm@UbuntuDesktop:~$
```