Laboratorium z etcd

Kod (plik distributed_cache.py):

```python
import json

from etcd_client import EtcdClient


class DistributedCache(object):
    def __init__(self, config_path, key_prefix, logger):
        self.etcd_client = EtcdClient(config_path, key_prefix, logger, 240)  # reconnect every 4 minutes
        self.logger = logger
        self.key_prefix = key_prefix
        self.cache = {}
        self.etcd_client.add_watch_prefix_callback(self.key_prefix, self.prefix_callback)

    def prefix_callback(self, event):
        print(event)

    def get(self, key: str, use_cache: bool = True) -> str:
        if use_cache and self.cache.get(key):
            return self.cache.get(key)

        full_key = str(self.key_prefix) + "/" + str(key)

        data = self.etcd_client.get(full_key)[0]

        if data is not None:
            data = json.loads(data.decode("utf8"))
            self.cache[key] = data

        return data

    def put(self, key: str, value: str):
        full_key = self.key_prefix + "/" + key
        json_value = json.dumps(value)
        self.etcd_client.put(full_key, json_value)

    def delete(self, key: str):
        full_key = self.key_prefix + "/" + key
        self.etcd_client.delete(full_key)
```

Testowanie Kodu lokalnie:

Uruchomienie aplikacji

```
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ USER_KEY_PREFIX=/HardekKrzysztof/ python app.py
<etcd_client.EtcdClient object at 0x7f4a3af09a90> /HardekKrzysztof/ <bound method DistributedCache.prefix_callback of <distri
 * Serving Flask app "app" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: off
 * Running on http://0.0.0.0:8080/ (Press CTRL+C to quit)
```

Uruchomienie aplikacji testującej

```
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ locust
[2020-05-26 23:24:03,828] krzys-przystojniak/INFO/locust.main: Starting web monitor at http://*:8089
[2020-05-26 23:24:03,828] krzys-przystojniak/INFO/locust.main: Starting Locust 0.14.6
```

Tworzę 40 użytkowników w tempie 10 na sekundę. Testy trwały około 3 minuty

Type	Name	# Requests	# Fails	Median (ms)	90%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
DELETE	/config/load_tests/<key>	220	0	180	340	199	59	525	0	1.4	0
PUT	/config/load_tests/<key>	260	0	180	410	212	60	716	44	1.7	0
GET	/config/load_tests/<key>?use_cache=false	2265	0	160	340	183	56	744	44	13.2	0
GET	/config/load_tests/<key>?use_cache=true	2545	0	4	6	8	2	638	44	13	0
	Aggregated	5290	0	59	280	101	2	744	42	29.3	0

Testowanie Kodu zdalnie:

Type	Name	# Requests	# Fails	Median (ms)	90%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
DELETE	/config/performance_tests/<key>	85	0	72	9300	2198	30	13817	0	0.7	0
PUT	/config/performance_tests/<key>	123	0	92	7000	1796	37	14108	44	1.1	0
GET	/config/performance_tests/<key>?use_cache=false	1037	1037	65	8500	1901	27	23758	5	8.9	8.9
GET	/config/performance_tests/<key>?use_cache=true	1026	1026	64	8500	1861	26	21014	5	8.8	8.8
	Aggregated	2271	2063	66	8500	1888	26	23758	7	19.5	17.7

Wyjaśnienie rozbieżności:

Niestety testy nie wyszły pozytywnie - wszystkie GET zawiodły. Nie wiem co jest przyczyną takiego stanu rzeczy. Wrzucam również screen'a z Failures z aplikacji locust:

# fails	Method	Name	Type
1037	GET	/config/performance_tests/?use_cache=false	CatchResponseError('Unexpected response: null\n',)
1026	GET	/config/performance_tests/?use_cache=true	CatchResponseError('Unexpected response: null\n',)

Odpowiedzi komend:

```
ibmcloud target
```

```
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ ibmcloud target


API endpoint:       https://cloud.ibm.com
Region:             eu-de
User:               hardek@student.agh.edu.pl
Account:            Krzysztof Hardek's Account (173e2df072da48edb6dc904dfaec1c84)
Resource group:     No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:    https://api.eu-de.cf.cloud.ibm.com (API version: 2.147.0)
Org:                hardek-org
Space:              hardek-space2
```

ibmcloud cf app distributed-cache

```
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ ibmcloud target


API endpoint:       https://cloud.ibm.com
Region:             eu-de
User:               hardek@student.agh.edu.pl
Account:            Krzysztof Hardek's Account (173e2df072da48edb6dc904dfaec1c84)
Resource group:     No resource group targeted, use 'ibmcloud target -g RESOURCE_GROUP'
CF API endpoint:    https://api.eu-de.cf.cloud.ibm.com (API version: 2.147.0)
Org:                hardek-org
Space:              hardek-space2
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ ibmcloud cf app distributed-cache
Invoking 'cf app distributed-cache'...

Showing health and status for app distributed-cache in org hardek-org / space hardek-space2 as hardek@student.agh.edu.pl...

name:              distributed-cache
requested state:   started
routes:            distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net
last uploaded:     Wed 03 Jun 18:26:35 CEST 2020
stack:             cflinuxfs3
buildpacks:        python

type:           web
instances:      4/4
memory usage:   256M
     state    since                  cpu    memory          disk           details
#0   running  2020-06-03T16:26:57Z   0.3%   37.4M of 256M   253.1M of 1G
#1   running  2020-06-03T16:27:10Z   0.3%   37.2M of 256M   253.1M of 1G
#2   running  2020-06-03T16:27:02Z   0.3%   37.4M of 256M   253.1M of 1G
#3   running  2020-06-03T16:27:20Z   0.3%   41.8M of 256M   253.1M of 1G
```

ibmcloud cf logs distributed-cache --recent | head -n 20

```
(venv) krzys@krzys-przystojniak:~/sem4/ibm-nosql/distributed-cache-python$ ibmcloud cf logs distributed-cache --recent | head -n 20
Invoking 'cf logs distributed-cache --recent'...

Retrieving logs for app distributed-cache in org hardek-org / space hardek-space2 as hardek@student.agh.edu.pl...

   2020-06-03T19:31:58.68+0200 [APP/PROC/WEB/3] OUT <etcd_client.EtcdClient object at 0x7f7aff02f2b0> /HardekKrzysztof2//performance_tests/nIHbCBPiOqbhSuUdEjH8llUxkfEhmLEHu8fmqKIBJZhgLoyExzDyvKnuBJAnEsiXuse_cache=true
   2020-06-03T19:31:58.62+0200 [APP/PROC/WEB/3] ERR 10.246.167.28 - - [03/Jun/2020 17:31:58] "GET https://distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net//config/performance_tests/ZjCQnyxMJLLMCcbnZPmXuuzlBFfhzYtqoMnGPEmgYPRHSEYikjLCTjflsMuRocMHuse_cache=true HTTP/1.1" 200 -

   2020-06-03T19:31:58.69+0200 [APP/PROC/WEB/0] OUT <etcd_client.EtcdClient object at 0x7f7c2026b208> /HardekKrzysztof2//performance_tests/mwpXTTLizmUpBpTfqLhJvBTUwuvokRaLctsGgiyhcynMIFqUtqHBUyzVMbpjeWCSuse_cache=true
   2020-06-03T19:31:58.70+0200 [APP/PROC/WEB/0] ERR 10.247.25.28 - - [03/Jun/2020 17:31:58] "GET https://distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net//config/performance_tests/mwpXTTLizmUpBpTfqLhJvBTUwuvokRaLctsGgiyhcynMIFqUtqHBUyzVMbpjeWCSuse_cache=true HTTP/1.1" 200 -
   2020-06-03T19:31:58.70+0200 [RTR/2] OUT distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net - [2020-06-03T17:31:58.670474044Z] "GET //config/performance_tests/mwpXTTLizmUpBpTfqLhJvBTUwuvokRaLctsGgiyhcynMIFqUtqHBUyzVMbpjeWCSuse_cache=true HTTP/1.1" 200 0 5 "-" "python-requests/2.23.0" "10.85.78.52:39450" "161.156.72.117:61186" x_forwarded_for:"161.156.72.117, 10.85.78.52" x_forwarded_proto:"https" vcap_request_id:"bab8ad7f-12b1-4aa4-6b80-c152e66983b9" response_time:0.029988 gorouter_time:0.000388 app_id:"98aaa8ae-b248-4308-9f8b-de51f086df5c" app_index:"0" x_global_transaction_id:"aad3dade5ed7de8e03e3b5af" true_client_ip:"-" x_b3_traceid:"5cefecc14811736e" x_b3_spanid:"5cefecc14811736e" x_b3_parentspanid:"-" b3:"5cefecc14811736e-5cefecc14811736e"
   2020-06-03T19:31:58.70+0200 [RTR/2] OUT
   2020-06-03T19:31:58.70+0200 [APP/PROC/WEB/2] OUT <etcd_client.EtcdClient object at 0x7f7aaa216208> /HardekKrzysztof2//performance_tests/BiTrsNYFGeHTeoWsoVrsSoUZNaAArEpXhpaCuJFJrkCvcXcaylcnKSBiItLGolasuse_cache=false
   2020-06-03T19:31:58.71+0200 [RTR/13] OUT distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net - [2020-06-03T17:31:54.198415237Z] "GET //config/performance_tests/ZjCQnyxMJLLMCcbnZPmXuuzlBFfhzYtqoMnGPEmgYPRHSEYikjLCTjflsMuRocMH?use_cache=true HTTP/1.1" 200 0 5 "-" "python-requests/2.23.0" "10.85.78.51:11813" "169.50.40.133:61166" x_forwarded_for:"161.156.72.117, 10.85.78.51" x_forwarded_proto:"https" vcap_request_id:"17429d5c-2bcb-4b8b-45fe-a8ffed91867e" response_time:4.524304 gorouter_time:0.000807 app_id:"98aaa8ae-b248-4308-9f8b-de51f086df5c" app_index:"3" x_global_transaction_id:"48cd8a595ed7de8a950b2511" true_client_ip:"-" x_b3_traceid:"022d42c0fe6a132c" x_b3_spanid:"022d42c0fe6a132c" x_b3_parentspanid:"-" b3:"022d42c0fe6a132c-022d42c0fe6a132c"
   2020-06-03T19:31:58.71+0200 [RTR/13] OUT
   2020-06-03T19:31:58.72+0200 [APP/PROC/WEB/0] OUT <etcd_client.EtcdClient object at 0x7f7c2026b208> /HardekKrzysztof2//performance_tests/frRnUbnnPXzKBuuaHPqAxAxBUjaKYiNdCNzmJTKopAKTKifPdoJqOhtXTSOirWdiuse_cache=false
   2020-06-03T19:31:58.73+0200 [APP/PROC/WEB/2] ERR 10.245.237.226 - - [03/Jun/2020 17:31:58] "GET https://distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net//config/performance_tests/BiTrsNYFGeHTeoWsoVrsSoUZNaAArEpXhpaCuJFJrkCvcXcaylcnKSBiItLGolasuse_cache=false HTTP/1.1" 200 -
   2020-06-03T19:31:58.74+0200 [RTR/0] OUT distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net - [2020-06-03T17:31:58.684863050Z] "GET //config/performance_tests/BiTrsNYFGeHTeoWsoVrsSoUZNaAArEpXhpaCuJFJrkCvcXcaylcnKSBiItLGolas?use_cache=false HTTP/1.1" 200 0 5 "-" "python-requests/2.23.0" "10.85.78.52:22316" "169.50.44.167:61086" x_forwarded_for:"161.156.72.117, 10.85.78.52" x_forwarded_proto:"https" vcap_request_id:"2e89c79f-589c-4099-5b43-67a03e8b496a" response_time:0.057921 gorouter_time:0.000356 app_id:"98aaa8ae-b248-4308-9f8b-de51f086df5c" app_index:"2" x_global_transaction_id:"aad3dade5ed7de8e05454eed" true_client_ip:"-" x_b3_traceid:"3153c1d1e097eaa8" x_b3_spanid:"3153c1d1e097eaa8" x_b3_parentspanid:"-" b3:"3153c1d1e097eaa8-3153c1d1e097eaa8"
   2020-06-03T19:31:58.74+0200 [RTR/0] OUT
   2020-06-03T19:31:58.75+0200 [APP/PROC/WEB/0] ERR 10.247.25.28 - - [03/Jun/2020 17:31:58] "GET https://distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net//config/performance_tests/frRnUbnnPXzKBuuaHPqAxAxBUjaKYiNdCNzmJTKopAKTKifPdoJqOhtXTSOirWdiuse_cache=false HTTP/1.1" 200 -
   2020-06-03T19:31:58.75+0200 [RTR/1] OUT distributed-cache-reliable-gorilla-ry.eu-de.mybluemix.net - [2020-06-03T17:31:58.713473792Z] "GET //config/performance_tests/frRnUbnnPXzKBuuaHPqAxAxBUjaKYiNdCNzmJTKopAKTKifPdoJqOhtXTSOirWdi?use_cache=false HTTP/1.1" 200 0 5 "-" "python-requests/2.23.0" "10.85.78.50:33783" "161.156.72.117:61186" x_forwarded_for:"161.156.72.117, 10.85.78.50" x_forwarded_proto:"https" vcap_request_id:"6296aea2-94cd-4206-6eb1-6a08840b0c4a1" response_time:0.039864 gorouter_time:0.000690 app_id:"98aaa8ae-b248-4308-9f8b-de51f086df5c" app_index:"0" x_global_transaction_id:"78f8097c5ed7de8e9fd9e311" true_client_ip:"-" x_b3_traceid:"01e5051366d18e71" x_b3_spanid:"01e5051366d18e71" x_b3_parentspanid:"-" b3:"01e5051366d18e71-01e5051366d18e71"
   2020-06-03T19:31:58.75+0200 [RTR/1] OUT
```