

IBM NoSql ETCD

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Poniżej prezentuję kod klasy DistributedCache wraz z zaimplementowanymi metodami get, put, delete oraz dodatkową, prefix_callback, niezbędną do użycia metody add_watch_prefix_callback:

```
from etcd_client import EtcdClient
import json

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)

    @staticmethod
    def prefix_callback(msg):
        print(msg)

    def get(self, key: str, use_cache: bool = True) -> str:
        if use_cache and self.cache.get(key):
            return self.cache.get(key)
        else:
            key_path = self.key_prefix + "/" + key
            value = self.etcd_client.get(key_path)[0]
            if not value:
                return value
            json_data = json.loads(value.decode('utf-8'))
            self.cache[key] = json_data
            return json_data

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

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

Następnie wykonałem lokalny test przy użyciu narzędzia locust:

Close

Start new Locust swarm

Number of total users to simulate

Hatch rate (users spawned/second)

Host

Start swarming

Test trwał 3 minuty:

Type	Name	# Requests	# Fails	Median (ms)	90thile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
DELETE	/config/load_tests/<key>	221	0	74	450	187	34	2708	0	0.7	0
PUT	/config/load_tests/<key>	259	0	64	450	205	32	2940	44	0.5	0
GET	/config/load_tests/<key>?use_cache=false	2313	0	65	390	172	31	2871	44	14.7	0
GET	/config/load_tests/<key>?use_cache=true	2568	0	2	2	3	1	602	44	14.9	0
Aggregated		5361	0	34	160	93	1	2840	42	30.8	0

Następnie za pomocą klienta na stronie IBM stworzyłem nowy space, do którego następnie podłączyłem się w konsoli:

Cloud Foundry Orgs /
jsolecki@student.agh.edu.pl

Spaces

Users

Domains

Info

Q

Add a space

Name	Region	ID	Manager	Date Created	Actions
test	Germany	938056e3-1ac3-47e9-abdc-9ee552cbc41c	✓	25.05.2020	⋮
dev	United Kingdom	3f42987e-d0ac-4a94-942a-3b494b2de0aa	✓	7.05.2020	⋮

```
[jakubs@PC distributed-cache-python]$ ibmcloud cf create-space test -o 'jsolecki@student.agh.edu.pl'
Invoking 'cf create-space test -o jsolecki@student.agh.edu.pl'...

Creating space test in org jsolecki@student.agh.edu.pl as jsolecki@student.agh.edu.pl...
OK

Space test already exists

[jakubs@PC distributed-cache-python]$ ibmcloud target --cf
Targeted Cloud Foundry (https://api.eu-de.cf.cloud.ibm.com)

Targeted org jsolecki@student.agh.edu.pl

Targeted space test

API endpoint:      https://cloud.ibm.com
Region:           eu-de
User:             jsolecki@student.agh.edu.pl
Account:          Jakub Solecki's Account (6b073388e2b94f9a8b28853874bf85ea)
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:              jsolecki@student.agh.edu.pl
Space:            test
[jakubs@PC distributed-cache-python]$
```

Kolejnym krokiem było dostarczenie aplikacji do chmury:

```
[jakubs@PC distributed-cache-python]$ ibmcloud cf apps
Invoking 'cf apps'...

Getting apps in org jsolecki@student.agh.edu.pl / space test as jsolecki@student.agh.edu.pl...
OK

name           requested state  instances  memory  disk  urls
locust         started          1/1        256M    1G    locust-thankful-kob-um.eu-de.mybluemix.net
distributed-cache started          4/4        256M    1G    distributed-cache-daring-gazelle-ry.eu-de.mybluemix.net
[jakubs@PC distributed-cache-python]$
```

Oraz uruchomienie test na locuście w chmurze (dla tych samych parametrów co lokalnie):

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>	248	0	49	84	63	28	1047	0	0.5	0
PUT	/config/performance_tests/<key>	285	0	56	110	90	26	1219	44	0.9	0
GET	/config/performance_tests/<key>?use_cache=false	2691	0	49	110	84	21	2042	44	14.2	0
GET	/config/performance_tests/<key>?use_cache=true	2704	0	38	83	68	16	2295	44	15	0
Aggregated		5928	0	45	98	76	16	2295	42	30.6	0

Jak widać powyżej instancja w chmurze jest szybsza od lokalnej. Wynika to z jej bezpośredniego dostępu do bazy Etcd. Sądzę również, że konfiguracja sprzętowa także może mieć wpływ na poprawę wydajności chmurowej instancji.

Poniżej przedstawiam pozostałe wymagane w sprawozdaniu informacje:

```
[jakubs@PC distributed-cache-python]$ ibmcloud cf app distributed-cache
Invoking 'cf app distributed-cache'...

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

name: distributed-cache
requested state: started
routes: distributed-cache-daring-gazelle-ry.eu-de.mybluemix.net
last uploaded: Mon 25 May 20:30:40 CEST 2020
stack: cflinuxfs3
buildpacks: python

type: web
instances: 4/4
memory usage: 256M

state      cpu    memory    disk    details
#0 running 2020-05-25T18:30:56Z 0.2% 36.8M of 256M 253.1M of 1G
#1 running 2020-05-25T18:31:06Z 0.4% 37.8M of 256M 253.1M of 1G
#2 running 2020-05-25T18:31:00Z 0.3% 36.8M of 256M 253.1M of 1G
#3 running 2020-05-25T18:30:56Z 0.3% 37M of 256M 253.1M of 1G

[jakubs@PC distributed-cache-python]$
```

```
[jakubs@PC 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 jsolecki@student.agh.edu.pl / space test as jsolecki@student.agh.edu.pl...

2020-05-25T20:46:31.74+0200 [APP/PROC/WEB/2] ERR 10.244.147.2 - - [25/May/2020 18:46:31] "GET /config/performance_tests/yxAiPxMMQgdnxJJBThzFiOlFXebZSLqvwznWudeLlyRYmkQWeeyOHUezofIoiBxN?use_cache=true HTTP/1.1" 200 -
2020-05-25T20:46:31.74+0200 [RTR/1] OUT distributed-cache-daring-gazelle-ry.eu-de.mybluemix.net - [2020-05-25T18:46:31.727651996Z] "GET /config/performance_tests/yxAiPxMMQgdnxJJBThzFiOlFXebZSLqvwznWudeLlyRYmkQWeeyOHUezofIoiBxN?use_cache=true HTTP/1.1" 200 0 44 "-" "python-requests/2.23.0" "10.85.78.51:46796" "161.156.72.105:61196" x_forwarded_for:"149.81.69.231, 10.85.78.51" x_forwarded_proto:"https" vcap_request_id:"8a854fbc-fded-40c5-6d2a-b314482cde92" response_time:0.021641 gorouter_time:0.000400 app_id:"2414b7ae-cf3d-4d10-a6ac-a924354035fb" app_index:"2" x_global_transaction_id:"48cd8a595ecc12870e2079e9" true_client_ip:"-" x_b3_traceid:"5a29b5b780dc42b3" x_b3_spanid:"5a29b5b780dc42b3" x_b3_parentspanid:"-" b3:"5a29b5b780dc42b3-5a29b5b780dc42b3"
2020-05-25T20:46:31.74+0200 [RTR/1] OUT
2020-05-25T20:46:31.79+0200 [APP/PROC/WEB/1] OUT <etcd_client.EtcdClient object at 0x7f361ae34128> jakubsolecki/performance_tests/orqMkNXDczqlldalXhCfJqascXbyZhCWCWjPPoGEIARsaoIMpNYzPzQxdKLHArHL
2020-05-25T20:46:31.79+0200 [APP/PROC/WEB/1] ERR 10.244.203.241 - - [25/May/2020 18:46:31] "GET /config/performance_tests/cdszPLNelyxGWKHNNcsmQHCSdqOGDoXONymEzLdBJSZGbtJrJlplAtRfCtszjRRa?use_cache=true HTTP/1.1" 200 -
2020-05-25T20:46:31.79+0200 [RTR/3] OUT distributed-cache-daring-gazelle-ry.eu-de.mybluemix.net - [2020-05-25T18:46:31.754916137Z] "GET /config/performance_tests/cdszPLNelyxGWKHNNcsmQHCSdqOGDoXONymEzLdBJSZGbtJrJlplAtRfCtszjRRa?use_cache=true HTTP/1.1" 200 0 44 "-" "python-requests/2.23.0" "10.85.78.50:47219" "169.50.39.154:61010" x_forwarded_for:"149.81.69.231, 10.85.78.50" x_forwarded_proto:"https" vcap_request_id:"02d3cf73-88e3-4dc7-4ff7-804a3c94dc41" response_time:0.044442 gorouter_time:0.000523 app_id:"2414b7ae-cf3d-4d10-a6ac-a924354035fb" app_index:"1" x_global_transaction_id:"78f8097c5ecc12878be4b0c7" true_client_ip:"-" x_b3_traceid:"06d5c45bad193250" x_b3_spanid:"06d5c45bad193250" x_b3_parentspanid:"-" b3:"06d5c45bad193250-06d5c45bad193250"
2020-05-25T20:46:31.79+0200 [RTR/3] OUT
2020-05-25T20:46:31.80+0200 [APP/PROC/WEB/1] ERR 10.244.203.241 - - [25/May/2020 18:46:31] "GET /config/performance_tests/orqMkNXDczqlldalXhCfJqascXbyZhCWCWjPPoGEIARsaoIMpNYzPzQxdKLHArHL?use_cache=false HTTP/1.1" 200 -
2020-05-25T20:46:31.81+0200 [APP/PROC/WEB/2] OUT <etcd_client.EtcdClient object at 0x7f68b4a33160> jakubsolecki/performance_tests/evLZtZfjXoAUjdndLRhLRGPdYKtPvzkRVBXGndNwnPcJMBuoOCeANJgGyNpFWLB
2020-05-25T20:46:31.82+0200 [APP/PROC/WEB/2] ERR 10.244.147.2 - - [25/May/2020 18:46:31] "DELETE /config/performance_tests/evLZtZfjXoAUjdndLRhLRGPdYKtPvzkRVBXGndNwnPcJMBuoOCeANJgGyNpFWLB HTTP/1.1" 204 -
2020-05-25T20:46:31.82+0200 [RTR/0] OUT distributed-cache-daring-gazelle-ry.eu-de.mybluemix.net - [2020-05-25T18:46:31.774264109Z] "DELETE /config/performance_tests/evLZtZfjXoAUjdndLRhLRGPdYKtPvzkRVBXGndNwnPcJMBuoOCeANJgGyNpFWLB HTTP/1.1" 204 0 0 "-" "python-requests/2.23.0" "10.85.78.50:27902" "161.156.72.105:61196" x_forwarded_for:"149.81.69.231, 10.85.78.50" x_forwarded_proto:"https" vcap_request_id:"6e2ebf32-5da6-428b-7d9d-70dfdf9e7ac" response_time:0.04918 gorouter_time:0.000710 app_id:"2414b7ae-cf3d-4d10-a6ac-a924354035fb" app_index:"2" x_global_transaction_id:"78f8097c5ecc12878be4b2b7" true_client_ip:"-" x_b3_traceid:"f6545fe639844ccd" x_b3_spanid:"f6545fe639844ccd" x_b3_parentspanid:"-" b3:"f6545fe639844ccd-f6545fe639844ccd"
2020-05-25T20:46:31.82+0200 [RTR/2] OUT
2020-05-25T20:46:31.83+0200 [APP/PROC/WEB/1] OUT <etcd_client.EtcdClient object at 0x7f361ae34128> jakubsolecki/performance_tests/gHNsCibmATZZzoreRqFdLxpyDgWRMuOzyMDSPMJdRAwQgZnSowdUuasGqfHUEtV
2020-05-25T20:46:31.86+0200 [APP/PROC/WEB/1] ERR 10.244.203.241 - - [25/May/2020 18:46:31] "GET /config/performance_tests/gHNsCibmATZZzoreRqFdLxpyDgWRMuOzyMDSPMJdRAwQgZnSowdUuasGqfHUEtV?use_cache=false HTTP/1.1" 200 -
[jakubs@PC distributed-cache-python]$
```