

Selfcheck acceptance test

1. create bridge-network dist_systems_lab_network:

```
docker network create -d bridge dist_systems_lab_network
```

2. initialize Master:

```
docker run -it --rm --network=dist_systems_lab_network -v$(pwd):/home -w/home --name Master python:3 bash
```

```
pip3 install sortedcontainers
```

3. initialize Secondary1, 2:

```
docker run -it --rm --network=dist_systems_lab_network -v$(pwd):/home -w/home --name Secondary1, 2 python:3 bash
```

```
pip3 install sortedcontainers
```

4. in Master run Master.py, in Secondary1 run Secondary1.py:

```
root@9d96a1afc783:/home# python3 Master.py
log2 < __main__.Master object at 0x7feacb82a910>
log1 < __main__.Master object at 0x7feacb82a910>
Starting client facing http server, use <Ctrl-C> to stop
Starting secondaries facing http server, use <Ctrl-C> to stop
```

```
root@bca4c1463758:/home# python3 Secondary1.py
Rejoined Master. Got log b'{'
Starting master facing http server, use <Ctrl-C> to stop
Starting client facing http server, use <Ctrl-C> to stop
```

5. initialize Client1:

```
docker run -it --rm --network=dist_systems_lab_network -v$(pwd):/home -w/home --name Client1 python:3 bash
```

6. in Client1 adding the 1st msg and looking for results:

```
curl -XPOST Master:8080/append -d'{"msg": "hello", "w":1}'
```

```
root@20c934518089:/home# curl -XPOST Master:8080/append -d'{"msg": "hello", "w": 1}'
Appended 00 "hello" to the log list
root@20c934518089:/home# echo m; curl Master:8080/list; echo s1; curl Secondary1:8080/list; echo s2; curl Secondary2:8080/list
m
(0, 'hello')
s1
(0, 'hello')
s2
curl: (7) Failed to connect to Secondary2 port 8080: Connection refused
root@20c934518089:/home#
```

master logs after 1st msg added - master doesnt wait for ACK from Secondary1 and does retries to connect to Secondary2

```

root@9d96a1afc783:/home# python3 Master.py
log2 < __main__.Master object at 0x7feacb82a910>
log1 < __main__.Master object at 0x7feacb82a910>
Starting client facing http server, use <Ctrl-C> to stop
Starting secondaries facing http server, use <Ctrl-C> to stop
172.18.0.3 - - [20/Dec/2022 22:35:24] "GET /rejoin HTTP/1.1" 200 -
Got append request for "hello" with write concern 1
Sending replicate request for "hello" message to Secondary1
Sending replicate request for "hello" message to Secondary2
Write concern is 1, not waiting for ACKs
172.18.0.5 - - [20/Dec/2022 22:36:03] "POST /append HTTP/1.1" 200 -
Appended 00 "hello" to the log list
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Got ACK trying to replicate (0, 'hello') to Secondary1
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello" message to Secondary2

```

Secondary1 logs after 1st msg added

```

Received replicate request for (0, 'hello') message from master
172.18.0.2 - - [20/Dec/2022 22:36:03] "POST /replicate HTTP/1.1" 200 -
Appended 00 "hello" to the log list

```

7. in Client1 adding 2nd msg and looking at results:

curl -XPOST Master:8080/append -d '{"msg": "hello2", "w": 2}'

```

root@20c934518089:/home# curl -XPOST Master:8080/append -d '{"msg": "hello2", "w": 2}'
Appended 01 "hello2" to the log list
root@20c934518089:/home# echo m; curl Master:8080/list; echo s1; curl Secondary1:8080/list; echo s2; curl Secondary2:8080/list
m
(0, 'hello')
(1, 'hello2')
s1
(0, 'hello')
(1, 'hello2')
s2
curl: (7) Failed to connect to Secondary2 port 8080: Connection refused
root@20c934518089:/home#

```

master logs after adding 2nd msg - see that it waits for ACK from Secondary1 and does retries to Secondary2

```

Sending replicate request for "hello2" message to Secondary1
Sending replicate request for "hello2" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello2', 1, <threading.Event at 0x7feaca6425d0: unset>) in 2s
Got ACK trying to replicate (1, 'hello2') to Secondary1
Got 1/1 ACKs
172.18.0.5 - - [20/Dec/2022 22:40:08] "POST /append HTTP/1.1" 200 -
Appended 01 "hello2" to the log list
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello2" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello2', 1, <threading.Event at 0x7feaca6425d0: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello2" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello2', 1, <threading.Event at 0x7feaca6425d0: unset>) in 2s
172.18.0.5 - - [20/Dec/2022 22:40:13] "GET /list HTTP/1.1" 200 -
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s
Sending replicate request for "hello2" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello2', 1, <threading.Event at 0x7feaca6425d0: unset>) in 2s
Sending replicate request for "hello" message to Secondary2
Secondary2 is down
Will retry replicate with args=('Secondary2', 'hello', 0, <threading.Event at 0x7feacb853210: unset>) in 2s

```

8. in Client1 adding 3rd msg -- see that request is blocked:

```

root@20c934518089:/home# curl -XPOST Master:8080/append -d '{"msg": "hello3", "w": 3}'
^C
root@20c934518089:/home#

```

looking at results

```

root@20c934518089:/home# echo m; curl Master:8080/list; echo s1; curl Secondary1:8080/list; echo s2; curl Secondary2:8080/list
m
(0, 'hello')
(1, 'hello2')
s1
(0, 'hello')
(1, 'hello2')
(2, 'hello3')
s2
curl: (7) Failed to connect to Secondary2 port 8080: Connection refused
root@20c934518089:/home#

```

9. initialize Client2:

```

docker run -it --rm --network=dist_systems_lab_network -v$(pwd):/home -w/home --name Client2 python:3
bash

```

10. in Client2 adding 4rd msg:

```

root@5494239fc2d1:/home# curl -XPOST Master:8080/append -d '{"msg": "hello4", "w": 1}'
Appended 03 "hello4" to the log list
root@5494239fc2d1:/home#

```

11. Turning on Secondary2 and looking at results:

```
root@84eb00595a04:/home# pip3 install sortedcontainers
Collecting sortedcontainers
  Downloading sortedcontainers-2.4.0-py2.py3-none-any.whl (29 kB)
Installing collected packages: sortedcontainers
Successfully installed sortedcontainers-2.4.0
WARNING: Running pip as the 'root' user can result in broken permissions and conf
a.io/warnings/venv
root@84eb00595a04:/home# python3 Secondary2.py
Rejoined Master. Got log b'{"0": "hello", "1": "hello2", "3": "hello4"}'
Starting client facing http server, use <Ctrl-C> to stop
Starting master facing http server, use <Ctrl-C> to stop
Received replicate request for (0, 'hello') message from master
Duplicate message (0, 'hello') received. Ignoring
172.18.0.2 - - [20/Dec/2022 22:49:43] "POST /replicate HTTP/1.1" 200 -
Received replicate request for (1, 'hello2') message from master
Duplicate message (1, 'hello2') received. Ignoring
172.18.0.2 - - [20/Dec/2022 22:49:43] "POST /replicate HTTP/1.1" 200 -
Received replicate request for (3, 'hello4') message from master
Duplicate message (3, 'hello4') received. Ignoring
172.18.0.2 - - [20/Dec/2022 22:49:43] "POST /replicate HTTP/1.1" 200 -
Received replicate request for (2, 'hello3') message from master
172.18.0.2 - - [20/Dec/2022 22:49:44] "POST /replicate HTTP/1.1" 200 -
Appended 02 "hello3" to the log list
```

```
root@5494239fc2d1:/home# echo m; curl Master:8080/list; echo s1; curl Secondary1:8080/list; echo s2; curl Secondary2:8080/list
m
(0, 'hello')
(1, 'hello2')
(2, 'hello3')
(3, 'hello4')
s1
(0, 'hello')
(1, 'hello2')
(2, 'hello3')
(3, 'hello4')
s2
(0, 'hello')
(1, 'hello2')
(2, 'hello3')
(3, 'hello4')
root@5494239fc2d1:/home#
```