



TUGAS 10

SISTEM TERDISTRIBUSI

Kelompok 5

- | | |
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Skenario Uji

1. Konsistensi Data dengan melakukan replikasi pada masing-masing storage
2. Waktu yang diperlukan untuk konsistensi data (second)
3. Performance jika jumlah storage service bertambah

Persiapan

- List Node Storage

```
≡ nodes.txt ×
1 A localhost:34572
2 B localhost:34573
3 C localhost:34574
4 D localhost:34575
5 E localhost:34576
```

- Run Web Server

-> masuk folder cmd lalu run run_web_server.bat

```
D:\Kuliah\SistemTerdistribusi\raft>.env\Scripts\activate.bat && cd cmd && run_web_server.bat
md && run_web_server.bat
                                                                    rver.py ../client/
(.env) D:\Kuliah\SistemTerdistribusi\raft\cmd>python ../client/runserver.py ../client/
* Serving Flask app "web" (lazy loading)
* Environment: production
  WARNING: Do not use the development server in a production environment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on http://localhost:5555/ (Press CTRL+C to quit)
```

Persiapan

- Mengaktifkan Node Storage "start_node.py (node)"
-> terdapat 4 node storage (A, B, C, D) dan melakukan proses *Leader Election*

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
```

```
A Voted for B in term 124  
A Voted for B in term 124  
A Became CANDIDATE  
A Became CANDIDATE  
A Current vote count is 2  
A Current vote count is 2  
A Current vote count is 3  
A Current vote count is 3  
A Became LEADER  
A Became LEADER  
A Became CANDIDATE  
A Became CANDIDATE  
A Current vote count is 2  
A Current vote count is 2  
A Current vote count is 3  
A Current vote count is 3  
A Became LEADER  
A Became LEADER
```

```
B Became CANDIDATE  
B Became CANDIDATE  
B Became CANDIDATE  
B Became CANDIDATE  
B Current vote count is 2  
B Current vote count is 2  
B Became CANDIDATE  
B Became CANDIDATE  
B Became CANDIDATE  
B Became CANDIDATE  
B Became CANDIDATE  
B Current vote count is 2  
B Current vote count is 2  
B Voted for A in term 125  
B Voted for A in term 125  
B Voted for A in term 126  
B Voted for A in term 126
```

```
(c) 2018 Microsoft Corporation. A  
eserved.  
  
D:\KuliaH\SistemTerdistribusi\rafts\activate.bat && cd cmd && sta  
at  
  
(.env) D:\KuliaH\SistemTerdistribusi\raft\cmd>python ../server/sta  
rt_node.py 2 ../nodes.txt  
C Became FOLLOWER  
C Became FOLLOWER  
C Became CANDIDATE  
C Became CANDIDATE  
C Voted for A in term 125  
C Voted for A in term 125  
C Voted for A in term 126  
C Voted for A in term 126
```

```
Microsoft Windows [Version 10.0.  
17134.407]  
(c) 2018 Microsoft Corporation.  
All rights reserved.  
  
D:\KuliaH\SistemTerdistribusi\ra  
ft>.env\Scripts\activate.bat &&  
cd cmd && start_node_3.bat  
  
(.env) D:\KuliaH\SistemTerdistri  
busi\raft\cmd>python ../server/s  
tart_node.py 3 ../nodes.txt  
D Became FOLLOWER  
D Became FOLLOWER
```

Storage Service A 34572

Storage Service B 34573

Storage Service C 34574

Storage Service D 34576

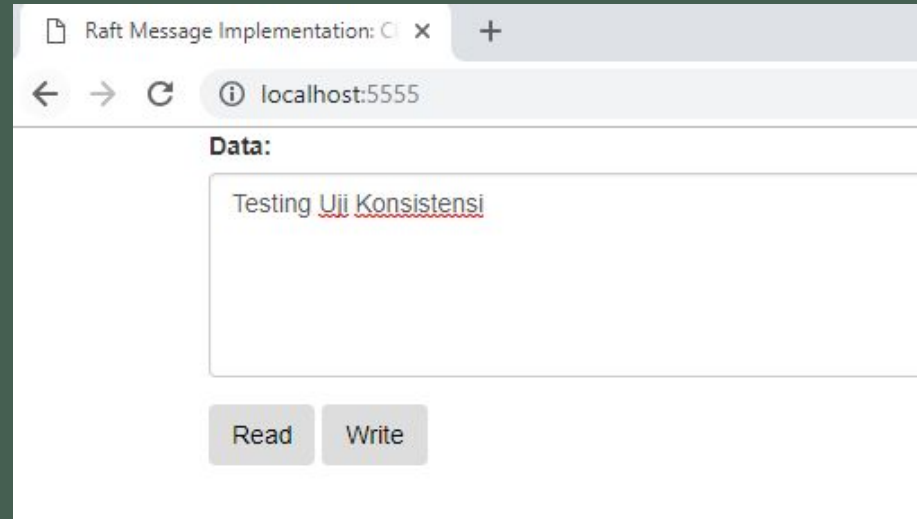
1. Skenario Uji Konsistensi Data

Skenario ini dilakukan yaitu ketika client mengirimkan data melalui web server berupa **value** dan dilakukan pengecekan **replikasi konsistensi data** pada setiap storage service.

Client melakukan request, dilakukan pengecekan pada node Leader dan semua storage apakah request sudah masuk. Setelah itu dilakukan pengecekan hasil replikasi data pada Follower.

Web Server

- Client melakukan request di web
 1. Membuka browser
 2. Mengetikkan link **localhost:5555**
 3. Mengisi pesan
“Testing Uji Konsistensi” dan klik tombol Write



1. Konsistensi Data (1)

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
```

2: python, python, pyth + [icon] [icon] [icon]

A Accepted new data VTesting Uji
Konsistensi
p0
.
A Accepted new data VTesting Uji
Konsistensi
p0
.
A Committed data changes: VTest
ing Uji Konsistensi
p0
.
A Committed data changes: VTest
ing Uji Konsistensi
p0
.
Total execution time: 0.00099992
7520752 seconds

p0
.
B Trying to set value VTesting Uji
Konsistensi
p0
.
B Value was updated
B Value was updated
B Committed data changes: VTesting
Uji Konsistensi
p0
.
B Committed data changes: VTesting
Uji Konsistensi
p0
.
Total execution time: 0.00300002098
083 seconds

D Accepted new data VTesting Uji
Konsistensi
p0
.
D Accepted new data VTesting Uji
Konsistensi
p0
.
D Committed data changes: VTest
ing Uji Konsistensi
p0
.
D Committed data changes: VTest
ing Uji Konsistensi
p0
.
Total execution time: 0.00199985
50415 seconds

C Accepted new data VTesting Uji
Konsistensi
p0
.
C Accepted new data VTesting Uji
Konsistensi
p0
.
C Committed data changes: VTest
ing Uji Konsistensi
p0
.
C Committed data changes: VTest
ing Uji Konsistensi
p0
.
Total execution time: 0.00099992
7520752 seconds

1. Konsistensi Data (2)

- Melakukan pengecekan hasil request dari client, dimana node follower akan request terlebih dahulu ke node Leader

```
.0.1', 49874)
A Trying to read value...
A Trying to read value...
A Read value was sent to ('127.0
.0.1', 50026)
A Read value was sent to ('127.0
.0.1', 50026)
A Trying to read value...
A Trying to read value...
A Read value was sent to ('127.0
.0.1', 50137)
A Read value was sent to ('127.0
.0.1', 50137)
A Trying to read value...
A Trying to read value...
A Read value was sent to ('127.0
.0.1', 50228)
A Read value was sent to ('127.0
.0.1', 50228)
A Trying to read value...
A Trying to read value...
A Read value was sent to ('127.0
.0.1', 51483)
A Read value was sent to ('127.0
.0.1', 51483)
█
```

```
B Current vote count is 2
B Voted for A in term 95
B Voted for A in term 95
B Accepted new data VTesting Uji
Konsistensi
p0
.
B Accepted new data VTesting Uji
Konsistensi
p0
.
B Committed data changes: VTesti
ng Uji Konsistensi
p0
.
B Committed data changes: VTesti
ng Uji Konsistensi
p0
.
Total execution time: 0.005999803
54309 seconds
B Trying to read value...
B Trying to read value...
B Redirecting request to A
B Redirecting request to A
█
```

```
C Became FOLLOWER
C Voted for A in term 95
C Voted for A in term 95
C Accepted new data VTesting Uji
Konsistensi
p0
.
C Accepted new data VTesting Uji
Konsistensi
p0
.
C Committed data changes: VTesti
ng Uji Konsistensi
p0
.
C Committed data changes: VTesti
ng Uji Konsistensi
p0
.
Total execution time: 0.008000135
42175 seconds
C Trying to read value...
C Trying to read value...
C Redirecting request to A
C Redirecting request to A
█
```

```
tart_node.py 3 ../nodes.txt
D Became FOLLOWER
D Became FOLLOWER
D Accepted new data VTesting Uji
Konsistensi
p0
.
D Accepted new data VTesting Uji
Konsistensi
p0
.
D Committed data changes: VTesti
ng Uji Konsistensi
p0
.
D Committed data changes: VTesti
ng Uji Konsistensi
p0
.
Total execution time: 0.00500011
444092 seconds
D Trying to read value...
D Trying to read value...
D Redirecting request to A
D Redirecting request to A
█
```


1. Konsistensi Data (3)

- Melakukan pengecekan hasil replikasi pesan yang dikirim, **value** yang dikirimkan ke storage A sama dengan node storage lainnya. Dengan ini data yang terdapat pada tiap storage **konsisten**.

```
(.env) D:\Kuliah\SistemTerdistribusi\raft\server>com.py get localhost:34573
VALUE:
    Testing Uji Konsistensi

(.env) D:\Kuliah\SistemTerdistribusi\raft\server>com.py get localhost:34574
VALUE:
    Testing Uji Konsistensi

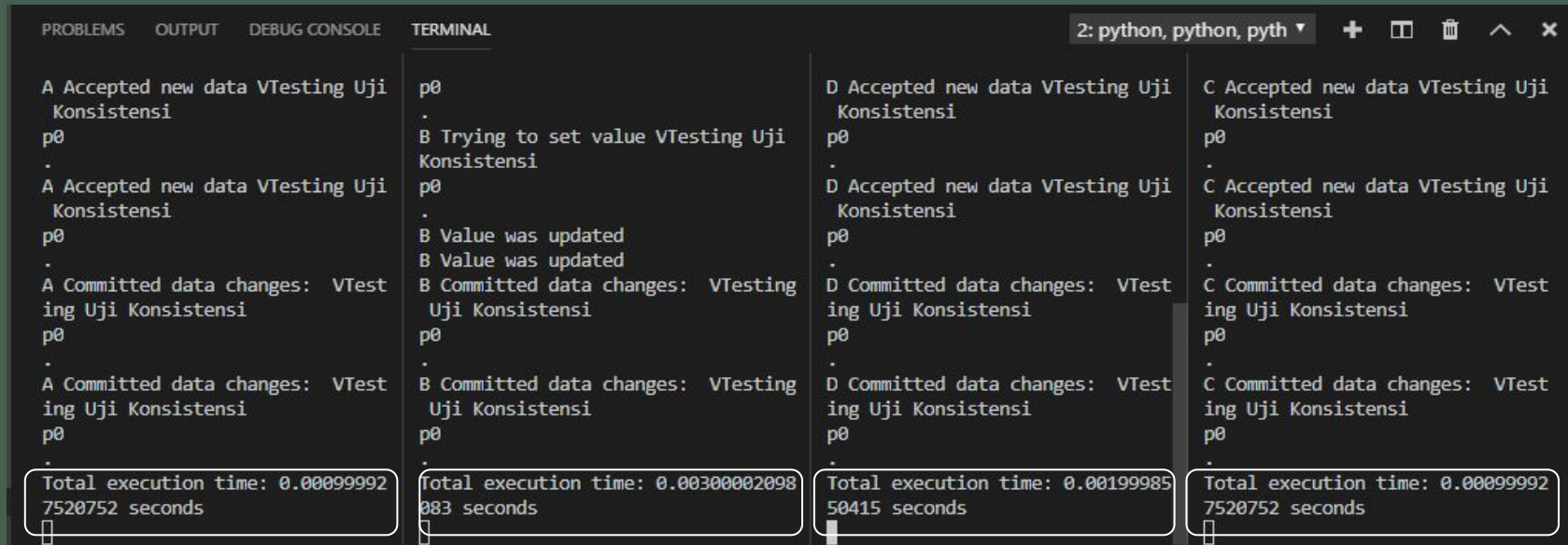
(.env) D:\Kuliah\SistemTerdistribusi\raft\server>com.py get localhost:34575
VALUE:
    Testing Uji Konsistensi

(.env) D:\Kuliah\SistemTerdistribusi\raft\server>com.py get localhost:34572
VALUE:
    Testing Uji Konsistensi

(.env) D:\Kuliah\SistemTerdistribusi\raft\server>
```

2. Skenario Uji Waktu Replikasi

Lama waktu yang dibutuhkan oleh Storage Service dalam mereplikasi data.



Storage Service	Log Messages	Total execution time
Storage Service A 34572	A Accepted new data VTesting Uji Konsistensi p0 A Accepted new data VTesting Uji Konsistensi p0 A Committed data changes: VTesting Uji Konsistensi p0 A Committed data changes: VTesting Uji Konsistensi p0	0.00099927520752 seconds
Storage Service B 34573	p0 B Trying to set value VTesting Uji Konsistensi p0 B Value was updated B Value was updated B Committed data changes: VTesting Uji Konsistensi p0 B Committed data changes: VTesting Uji Konsistensi p0	0.00300002098083 seconds
Storage Service C 34574	D Accepted new data VTesting Uji Konsistensi p0 D Accepted new data VTesting Uji Konsistensi p0 D Committed data changes: VTesting Uji Konsistensi p0 D Committed data changes: VTesting Uji Konsistensi p0	0.0019998550415 seconds
Storage Service D 34575	C Accepted new data VTesting Uji Konsistensi p0 C Accepted new data VTesting Uji Konsistensi p0 C Committed data changes: VTesting Uji Konsistensi p0 C Committed data changes: VTesting Uji Konsistensi p0	0.00099927520752 seconds

Storage Service A 34572

Storage Service B 34573

Storage Service C 34574

Storage Service D 34575

2. Waktu yang diperlukan untuk konsistensi data

Testing 4 Storage	Waktu Eksekusi
A localhost:34572	0.005000114411
B localhost:34573	0.005999804
C localhost:34574	0.008000135
D localhost:34575	0.005000114
Rata-rata	0.006000041954

3. Skenario Uji Penambahan Storage Service

Skenario ini dilakukan ketika web server dan node sudah aktif, setelah itu dilakukan penambahan storage service (node). Akan dilakukan pengecekan bagaimana performa jika node tersebut ditambahkan dan apakah node tersebut ikut tereplikasi atau tidak.

3. Performance jika jumlah storage service bertambah

1

```
D:\Kuliah\SistemTerdistribusi\raft>.env\Scripts\activate.bat && cd  
cmd && start_node_4.bat
```

```
(.env) D:\Kuliah\SistemTerdistribusi\raft>python ../server/start_node.py 4 ../nodes.txt  
E Became FOLLOWER  
E Became FOLLOWER  
E Trying to read value...  
E Trying to read value...  
E Redirecting request to A  
E Redirecting request to A  
█
```

2

```
(.env) D:\Kuliah\SistemTerdistribusi\raft\server>com.py get localhost:34576  
VALUE:
```

Testing Uji Konsistensi

1. Ketika storage service ditambah, hasilnya adalah storage service tersebut otomatis menjadi Follower.
2. Storage service yang baru ditambahkan dilakukan pengujian apakah data yang sebelumnya diinputkan tereplikasi atau tidak, dan hasilnya storage service tersebut berhasil tereplikasi.

3. Waktu yang diperlukan untuk replikasi jika storage ditambah

Testing 4 Storage	Waktu Eksekusi
A localhost:34572	0.005000114411
B localhost:34573	0.005999804
C localhost:34574	0.008000135
D localhost:34575	0.005000114
Rata-rata	0.006000041954

Tambah 1 Storage	Waktu Eksekusi
A localhost:34572	0.006000004196
B localhost:34573	0.009999276
C localhost:34574	0.009999275
D localhost:34575	0.006000042
E localhost:34576	0.003999949
Rata-rata	0.007199709078

TERIMA KASIH