188.427 VU E-Commerce 2016WS

Patrick Sommer 0925011, Julia Filler 1225408, Constantin Brîncoveanu 1225561

Baseline

Selected Baseline: Retry

- improvements:
  - request will be tried to send up to 5 times
  - > 5 times - the request will be send to another edge in the near of the user

Selected programming language: Java

Developments

Modes:

- no retry - migrate random
- no retry - migrate random + SLA (ensure that there is enough time to migrate) and migrate if PM is 3/4 full
- retry - migrate random
- retry - migrate random + SLA (ensure that there is enough time to migrate) and migrate if PM is 3/4 full

Failure handling

```
if(modus == 3 || modus == 4){   failure = Math.random() < failureProbability; }
```

request check if it is delivered: true

request check if it is delivered: false

request modus fails on PM

no success!

request modus fails on VM

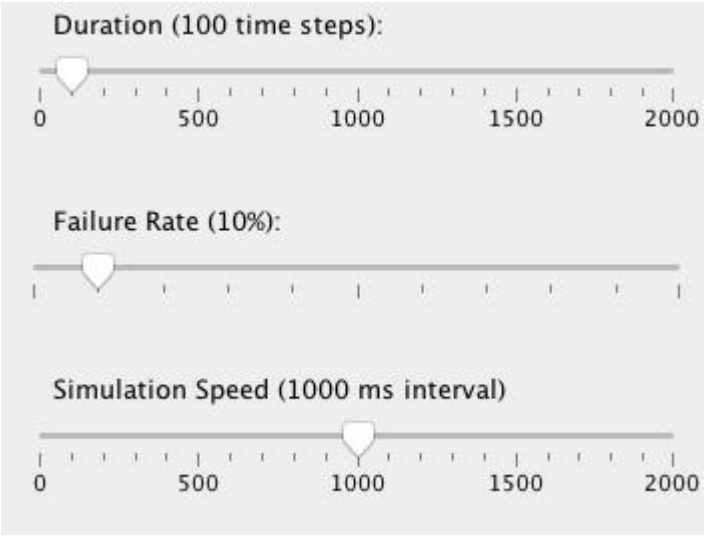
Success!!

SLA's

- Agreed VM characteristics
- Users (requests) Total
- Users satisfied
- Pending requests
- Avg. Requests per Time Step
- Total Energy Consumption
- Average Latency
- Vmig
- Dirty pages rate
- Memory

Results - Settings

- Duration 100 time steps
- Failure rate 10%
- Simulation Speed 1000 ms intervall
- 3 runs



Results

	no retry - migrate random	**no retry - migrate random + SLA**
Run 1	PM is full after a few steps after 1 min, after round 30 migrations, Vmig = 80	no termination, round 943 migrations, Vmig = 5 - 325
Run 2	PM is full after a few steps after 2 min, after round 53 migrations, Vmig = 130	no termination, round 821 migrations, Vmig = 5 - 440
Run 3	PM is full after a few steps after 1 min, after round 32 migrations, Vmig = 90	no termination, round 1035 migrations, Vmig = 5 - 330

Results

	retry - migrate random	**retry - migrate random + SLA**
Run 1	PM is full after a few steps after round 1 min, after round 30 migrations, 2 fail edge, 1 fail on pm, 4 fails on VM, resending fails 2 times, Vmig = 50	no termination, round 1200 migrations, 731 fail edge, 737 fail on pm, 800 fails on VM, resending fails 10 times, Vmig = 5 - 260
Run 2	PM is full after a few steps after round 1 min, after round 7 migrations, 8 fail edge, 6 fail on pm, 12 fails on VM, resending fails 3 times, Vmig = 40	no termination, round 1400 migrations, 888 fail edge, 838 fail on pm, 1500 fails on VM, resending fails 19 times, Vmig = 5 - 260
Run 3	PM is full after a few steps after round 1 min, after round 9 migrations, 0 fail edge, 2 fail on pm, 6 fails on VM, resending fails 3 times, Vmig = 40	no termination, round 1060 migrations, 727 fail edge, 725 fail on pm, 1200 fails on VM, resending fails 14 times, Vmig = 5 - 280

Result Analysis

- **Great improvement:** stop after five times, and find an othe resource

- If no Retry was used, less migrations were performed.
- The use of SLAs greatly increased the number of fails.

DEMO

Further improvements

- Changing the intervals (time-based)
- Changing resource after 3 retries
- Priority → Edge > PM > VM
- Validity check
- More statistical values
- Interesting observation: Failure rate = 100% → modus 4 is terminating