



Analizando o pig com com o mininet

Felipe Antunes Quirino
Yisiah García Montalvo

Introdução

Testar chatbot desenvolvido a
partir de uma topologia emulada



Mininet

Ferramenta para emular
topologías





Desenvolvimento

Criação de um chatbot ao nível de aplicação equipado com três funções básicas.

Instalação e teste dos recursos da mininet.

Implementação do chat-bot em uma topologia emulada.

Tecnologías Utilizadas

Python 3,7

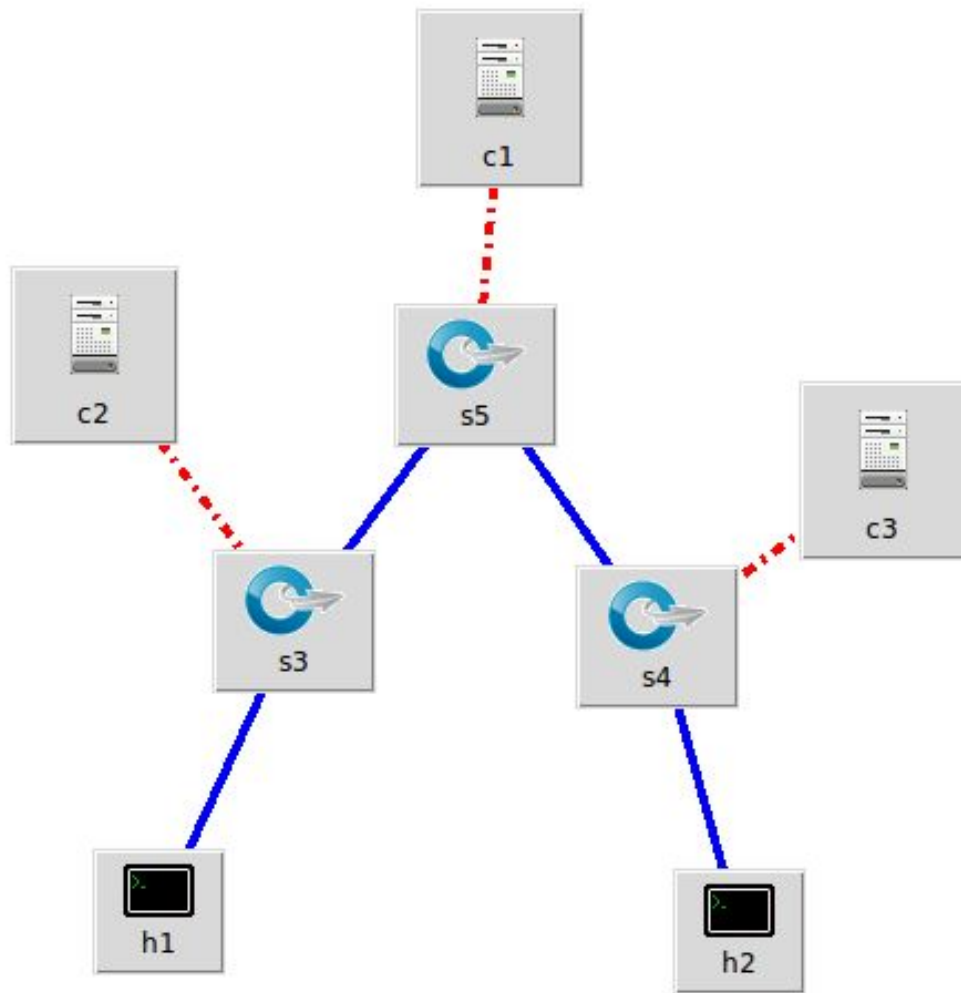


VMware
workstation



Mininet

Mininet



Adicionando internet

Por default ele adiciona internet
no roteador “S5”

```
64 net.addNAT().configDefault()  
65 net.start()
```

Testando para o host h1

(h1 = 10.0.0.1)
(h2 = 10.0.0.2)

```
mininet@mininet-vm: ~  
0.0.0.0 1 delay 0% loss) (10.0.0.0 10000 delay 0% lo  
ting controller  
c3 c1 c2  
*** Starting 3 switches  
s5 (10.0.0.0 10000 delay 0% loss) (10.0.0.0 10000  
s) s4 (10.0.0.0 1 delay 0% loss) (10.0.0.0 10000 d  
) s3 (10.0.0.0 1 delay 0% loss) (10.0.0.0 10000 de  
... (10.0.0.0 10000 delay 0% loss) (10.0.0.0 10000  
ss) (10.0.0.0 1 delay 0% loss) (10.0.0.0 10000 del  
(10.0.0.0 1 delay 0% loss) (10.0.0.0 10000 delay 0  
*** Post configure switches and hosts  
*** Starting CLI:  
mininet> h1 xterm  
mininet> h1 xterm  
mininet> links  
h1-eth0<->s3-eth1 (OK OK)  
h2-eth0<->s4-eth1 (OK OK)  
s4-eth2<->s5-eth1 (OK OK)  
s3-eth2<->s5-eth2 (OK OK)  
nat0-eth0<->s5-eth3 (OK OK)  
mininet> link h3 s5 down  
src not in network: h3  
mininet> link s3 s5 down  
mininet> link s3 s5
```

```
root@mininet-vm: ~  
root@mininet-vm:~# ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=127 time=73.0 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=127 time=46.6 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=127 time=45.2 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=127 time=46.0 ms  
64 bytes from 8.8.8.8: icmp_seq=5 ttl=127 time=45.0 ms  
64 bytes from 8.8.8.8: icmp_seq=6 ttl=127 time=52.5 ms  
64 bytes from 8.8.8.8: icmp_seq=7 ttl=127 time=46.0 ms  
64 bytes from 8.8.8.8: icmp_seq=8 ttl=127 time=45.4 ms  
64 bytes from 8.8.8.8: icmp_seq=9 ttl=127 time=49.4 ms  
From 8.8.8.8 icmp_seq=54 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=55 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=56 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=57 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=58 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=59 Destination Host Unreachable  
[]
```

```
root@mininet-vm: ~  
root@mininet-vm:~# ping 10.0.0.2  
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.  
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=95.3 ms  
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=41.1 ms  
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=40.6 ms  
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=40.7 ms  
64 bytes from 10.0.0.2: icmp_seq=5 ttl=64 time=40.8 ms  
64 bytes from 10.0.0.2: icmp_seq=6 ttl=64 time=40.8 ms  
64 bytes from 10.0.0.2: icmp_seq=7 ttl=64 time=41.5 ms  
From 10.0.0.2 icmp_seq=53 Destination Host Unreachable  
From 10.0.0.2 icmp_seq=54 Destination Host Unreachable  
From 10.0.0.2 icmp_seq=55 Destination Host Unreachable  
[]
```


Testando para o host h2

(h1 = 10.0.0.1)
(h2 = 10.0.0.2)

```
mininet@mininet-vm: ~  
> s3 (10.00Mbit 1 delay 0% loss) (10.00Mbit 1000  
... (10.00Mbit 10000 delay 0% loss) (10.00Mbit 1  
ss) (10.00Mbit 1 delay 0% loss) (10.00Mbit 10000  
(10.00Mbit 1 delay 0% loss) (10.00Mbit 10000 del  
*** Post configure switches and hosts  
*** Starting CLI:  
mininet> h1 xterm &  
mininet> h1 xterm &  
mininet> links  
h1-eth0<->s3-eth1 (OK OK)  
h2-eth0<->s4-eth1 (OK OK)  
s4-eth2<->s5-eth1 (OK OK)  
s3-eth2<->s5-eth2 (OK OK)  
nat0-eth0<->s5-eth3 (OK OK)  
mininet> link h3 s5 down  
src not in network: h3  
mininet> link s3 s5 down  
mininet> link s3 s5 up  
mininet> h2 xterm &  
mininet> h2 xterm &  
mininet> link s4 s5 down  
mininet> link s4 s5 up  
mininet> link s4 s5 down  
mininet> U
```

```
root@mininet-vm: ~  
root@mininet-vm:~# ping 8.8.8.8  
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=127 time=46.2 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=127 time=44.6 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=127 time=45.0 ms  
From 8.8.8.8 icmp_seq=32 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=35 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=34 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=35 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=36 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=37 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=38 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=39 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=40 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=41 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=42 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=43 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=44 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=45 Destination Host Unreachable  
From 8.8.8.8 icmp_seq=46 Destination Host Unreachable  
root@mininet-vm:~# ping 10.0.0.1  
PING 10.0.0.1 (10.0.0.1) 56(84) bytes of data.  
64 bytes from 10.0.0.1: icmp_seq=1 ttl=64 time=46.3 ms  
64 bytes from 10.0.0.1: icmp_seq=2 ttl=64 time=44.9 ms  
64 bytes from 10.0.0.1: icmp_seq=3 ttl=64 time=41.4 ms  
64 bytes from 10.0.0.1: icmp_seq=4 ttl=64 time=40.8 ms  
64 bytes from 10.0.0.1: icmp_seq=5 ttl=64 time=40.6 ms  
From 10.0.0.1 icmp_seq=34 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=35 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=36 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=37 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=38 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=39 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=40 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=41 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=42 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=43 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=44 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=45 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=46 Destination Host Unreachable  
From 10.0.0.1 icmp_seq=47 Destination Host Unreachable
```

Testando cliente-servidor

(h1 = 10.0.0.1)
(h2 = 10.0.0.2)

```
root@mininet-vm: ~/trab1_redes/client
root@mininet-vm:~/trab1_redes/client# cat test.txt
\verlivros
\verdolar
root@mininet-vm:~/trab1_redes/client# time python3 client.py 10.0.0.1 5001 < test.txt
connecting...
received \verlivros

received
Livro: Ações Comuns, lucros extraordinários
Autor: Philip Fisher
Este livro é um dos maiores clássicos da área de investimentos em ações. Sua leitura oferece elementos para uma melhor compreensão s
obre o tema, além de técnicas de avaliação que possibilita ao investidor se envolver mais com os seus investimentos.

received \verdolar

received preço de baixo: 4,1835
preço de alta: 4,2458
preço de bid: 4,2364
preço de ask: 4,2369

closing socket

real    0m0.330s
user    0m0.036s
sys     0m0.004s
root@mininet-vm:~/trab1_redes/client#
```

```
root@mininet-vm: ~/trab1_redes/server
root@mininet-vm:~/trab1_redes/server# python3 server.py 0.0.0.0 5001
aguardando conexao...
aguardando conexao...
b'\verlivros'
b'\verdolar'
```

Fazendo testes aumentando o atraso

Fazer várias simulações aumentando de 5 em 5ms de 0 até 375ms (onde começa a dar falhas)



Fórmula analítica

Deve ser o tempo total de uma
conexão com o servidor e outra
conexão com o servidor + internet



Fórmula analítica (x é atraso)

internet até $h2 = x^2 + 40$

h1 a $h2 = x^4$

primeira conexão h1 $h2 = x^4$

primeira conexão h1 até

internet $= x^2 + 40$

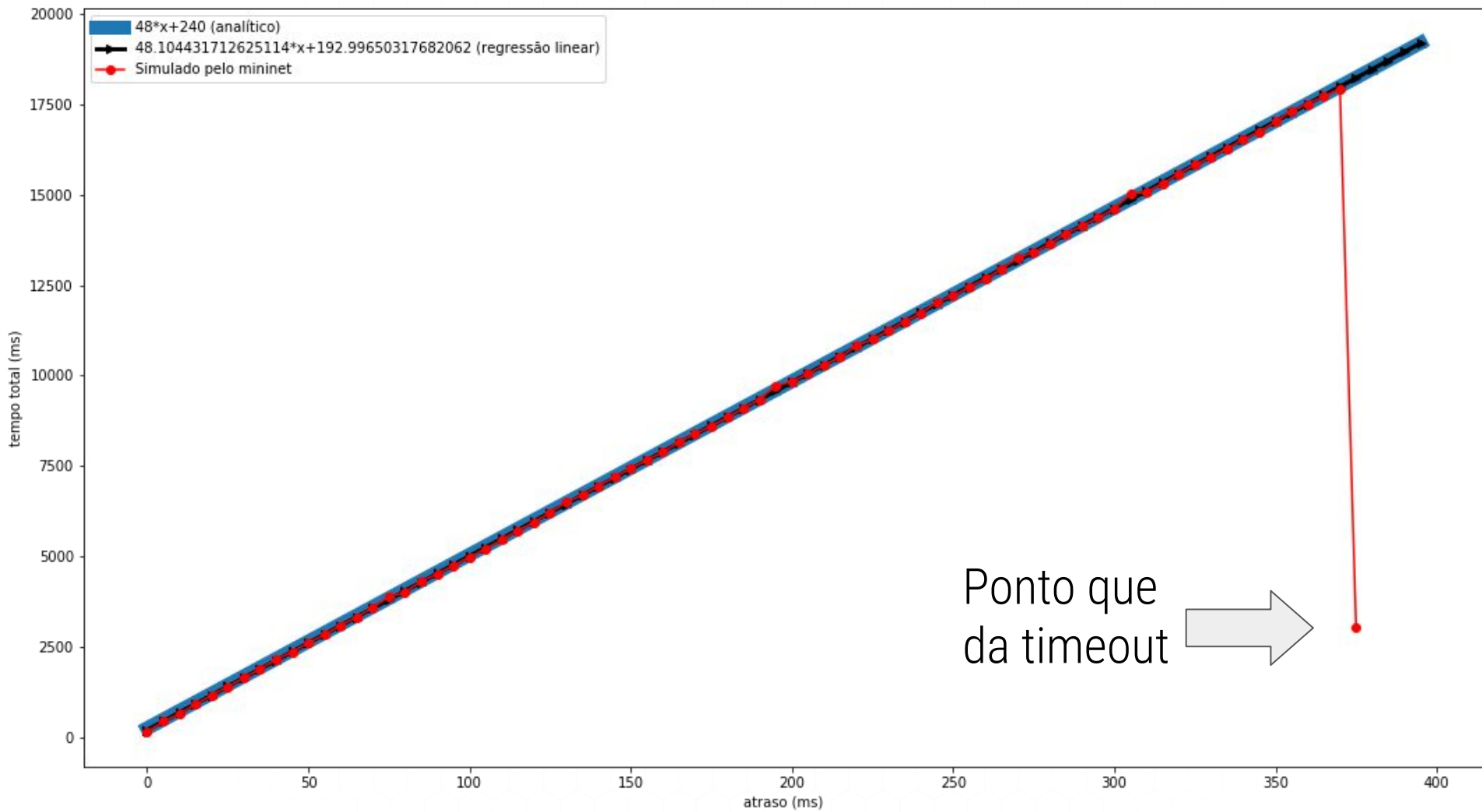
constante = 3



Tempo total

constante*(2*h1 a h2 + internet
até h2 +primeira conexão h1 h2
+primeira conexão h1 internet)





Conclusão

Atingiu os resultado esperados
quando são removidos os
nodos

Modelo analítico bateu com
regressão linear



Trabalhos futuros

Testar os modelos variando o atraso na prática

Testar variando a latência também

Testar para topologia com maior quantidade de switches e hosts



The background features a teal-to-purple gradient with a faint hexagonal grid. On the left and right sides, there are clusters of white-outlined hexagons and cubes. Some of these shapes have small teal dots at their vertices, and some are filled with a lighter shade of the background color. The word "Obrigado!" is centered in the middle of the slide in a large, white, sans-serif font.

Obrigado!

Alguma questão?