

Report 2: Routy: a small routing protocol

Jiayi Feng

September 22, 2021

1 Introduction

The task 2 is to implement a link-state routing protocol in Erlang. The link-state protocol is used in for example OSPF, the most used routing protocol for Internet routers. The aim of this exercise is that you should be able to:

- describe the structure of a link-state routing protocol
- describe how a consistent view is maintained
- reflect on the problems related to network failures

2 Main problems and solutions

After carefully reading of the pdf file, there should be in total five erl file, which will be compiled in the name of map, dijkstra, intf, hist, and roudy. Both the map and dijkstra are taught by TA, so further work can be continued, despite some unknown factors. In map.erl, both **fun** and **foldl** were used in function *all_nodes*. In dijkstra.erl, iterate has always been a problem which i did not fully understand. intf and hist stand for interface and history, respectively. Command are related to intf.erl and the hist.erl has a message number. If the message number is smaller, then it is the old message waiting for delect. routy.erl has tutorials in pdf, so I did not understand them all.

3 Evaluation

```
ect_all false
Eshell V12.0 (abort with ^G)
(china@LAPTOP-6A4S1HFF)1> r(routy).
** exception error: undefined shell command r/1
(china@LAPTOP-6A4S1HFF)2> r(roudy).
** exception error: undefined shell command r/1
(china@LAPTOP-6A4S1HFF)3> c(routy).
(ok, routy)
(china@LAPTOP-6A4S1HFF)4> routy:start(beijing).
Router: beijing <0.95.0>      Manage_process: <0.96.0>
ok
(china@LAPTOP-6A4S1HFF)5> beijing: Adding 'beijing'
(china@LAPTOP-6A4S1HFF)5> routy:start(shanghai).
Router: shanghai <0.98.0>      Manage_process: <0.99.0>
shanghai: Adding 'shanghai'
ok
(china@LAPTOP-6A4S1HFF)6> routy:start(henan).
Router: henan <0.101.0>      Manage_process: <0.102.0>
henan: Adding 'henan'
ok
(china@LAPTOP-6A4S1HFF)7> beijing!{add, henan, {henan,'china@LAPTOP-6A4S1HFF'}}.
beijing: Adding 'henan'
{add,henan,{henan,'china@LAPTOP-6A4S1HFF'}}
(china@LAPTOP-6A4S1HFF)8> shanghai!{add, henan, {henan,'china@LAPTOP-6A4S1HFF'}}.
shanghai: Adding 'henan'
{add,henan,{henan,'china@LAPTOP-6A4S1HFF'}}
(china@LAPTOP-6A4S1HFF)9> henan!{add, beijing, {beijing,'china@LAPTOP-6A4S1HFF'}}.
henan: Adding 'beijing'
{add,beijing,{beijing,'china@LAPTOP-6A4S1HFF'}}
(china@LAPTOP-6A4S1HFF)10> henan!{add, shanghai, {shanghai,'china@LAPTOP-6A4S1HFF'}}.
henan: Adding 'shanghai'
{add,shanghai,{shanghai,'china@LAPTOP-6A4S1HFF'}}
(china@LAPTOP-6A4S1HFF)11> beijing!broadcast.
broadcast
(china@LAPTOP-6A4S1HFF)12> beijing!{send, beijing, "hello, myself"}.
beijing: Received message 'hello, myself' from beijing
{send,beijing,"hello, myself"}
(china@LAPTOP-6A4S1HFF)13>
beijing!{send, henan, "hello, henan."}.
beijing: Routing message ('hello, henan.') from beijing to henan
{send,henan,"hello, henan."}
henan: Received message 'hello, henan.' from beijing
(china@LAPTOP-6A4S1HFF)14>
```

Figure 1: first half

```

(china@LAPTOP-6A4S1HFF)13>
beijing!{send, henan, "hello, henan."}.
beijing: Routing message ('hello, henan.') from beijing to henan
{send, henan, "hello, henan."}
henan: Received message 'hello, henan.' from beijing
(china@LAPTOP-6A4S1HFF)14> beijing!broadcast.
broadcast
(china@LAPTOP-6A4S1HFF)15> henan!broadcast.
broadcast
(china@LAPTOP-6A4S1HFF)16> shanghai!broadcast.
broadcast
(china@LAPTOP-6A4S1HFF)17> beijing!update.
update
(china@LAPTOP-6A4S1HFF)18> henan!update.
update
(china@LAPTOP-6A4S1HFF)19> shanghai!update.
update
(china@LAPTOP-6A4S1HFF)20> beijing!{send, shanghai, "hello, shanghai"}.
beijing: Routing message ('hello, shanghai') from beijing to shanghai
shanghai: Received message 'hello, shanghai' from beijing
{send, shanghai, "hello, shanghai"}
(china@LAPTOP-6A4S1HFF)21> shanghai!{send, beijing, "hello, beijing"}.
shanghai: Routing message ('hello, beijing') from shanghai to beijing
beijing: Received message 'hello, beijing' from shanghai
{send, beijing, "hello, beijing"}
(china@LAPTOP-6A4S1HFF)22> beijing!{send, henan, "hello, henan."}.
beijing: Routing message ('hello, henan.') from beijing to henan
henan: Received message 'hello, henan.' from beijing
{send, henan, "hello, henan."}
(china@LAPTOP-6A4S1HFF)23> beijing!{send, beijing, "hello, myself"}.
beijing: Received message 'hello, myself' from beijing
{send, beijing, "hello, myself"}
(china@LAPTOP-6A4S1HFF)24>

```

Figure 2: second half

4 Conclusions

Programs have been successfully compiled, and the command has been shown in the evaluation part.

connection between henan, beijing and shanghai is successful. As a result, information can be spread between these nodes or gateways.