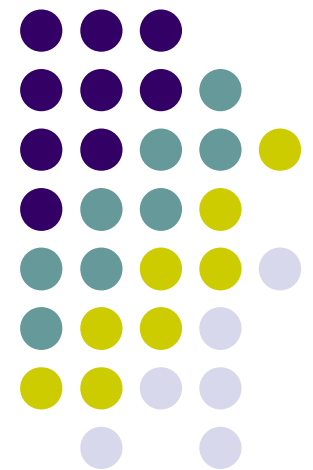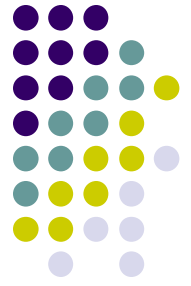# ssmping and asmping

Stig Venaas
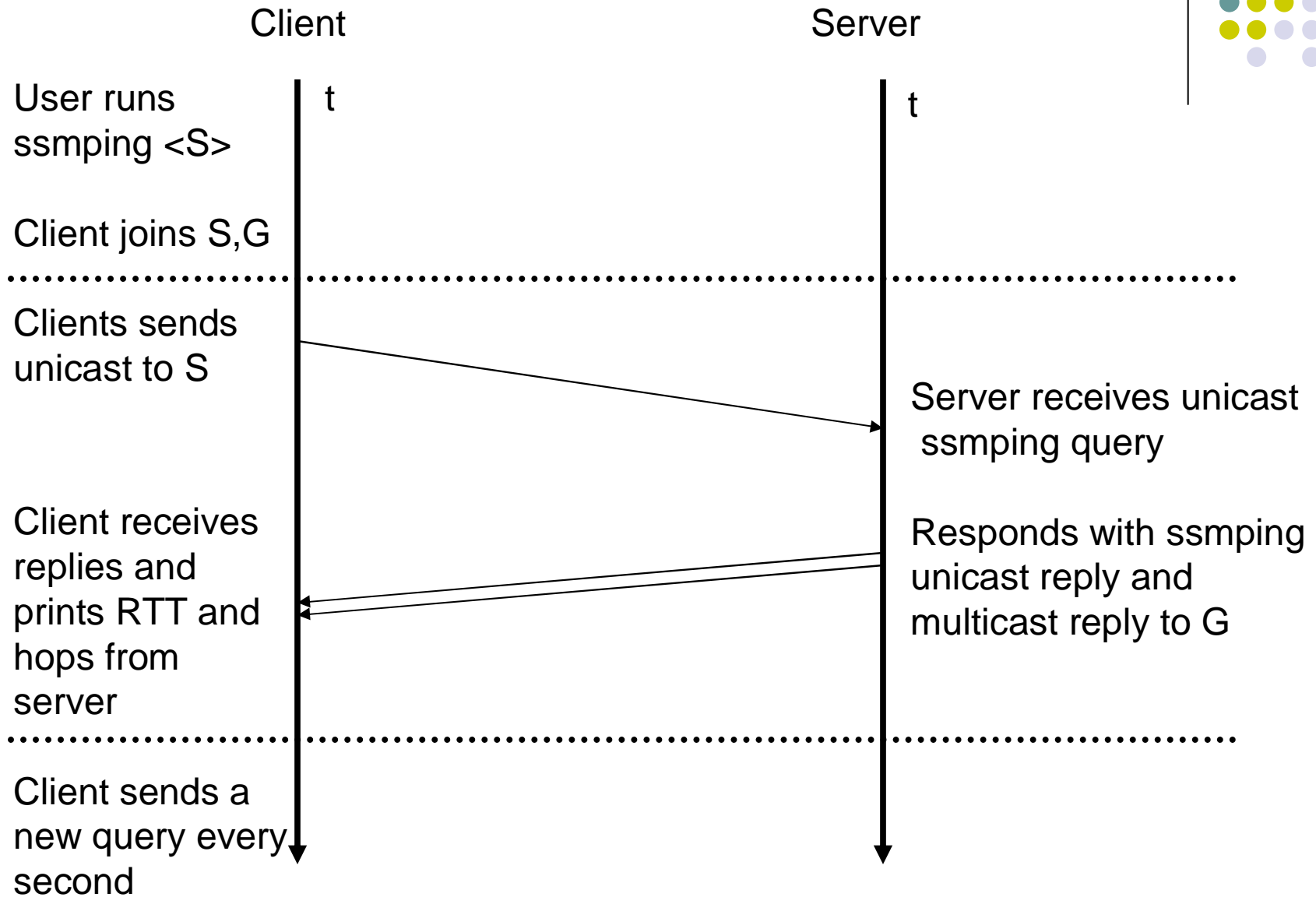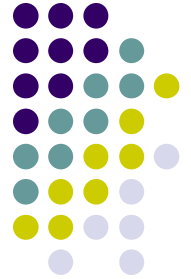
venaas@uninett.no

UNINETT – AS224

ssmping

- A tool for testing multicast connectivity and more
- Behavior is a bit like the common ping tool
- Implemented at application layer using UDP
  - No additional requirements on the operating system
  - The operating system and network must support SSM
- A server must run ssmpingd
- A client pings a server by sending a unicast ssmping query
- The server replies with both unicast and multicast ssmping replies
- In this way a client can check that it receives SSM from the server
  - And also parameters like delay, number of router hops etc.

How it works

Client   Server

User runs
ssmping <S>   t   t

Client joins S,G

Clients sends
unicast to S
                                              Server receives unicast
                                               ssmping query

Client receives
replies and   Responds with ssmping
prints RTT and   unicast reply and
hops from   multicast reply to G
server

Client sends a
new query every
second

ssmping example
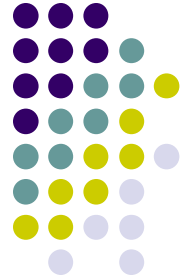
```
$ ssmping -c 5 -4 flo.nrc.ca
ssmping joined (S,G) = (132.246.2.20,232.43.211.234)
pinging S from 158.38.63.20
  unicast from 132.246.2.20, seq=1 dist=13 time=122.098 ms
  unicast from 132.246.2.20, seq=2 dist=13 time=122.314 ms
multicast from 132.246.2.20, seq=2 dist=13 time=125.061 ms
  unicast from 132.246.2.20, seq=3 dist=13 time=122.327 ms
multicast from 132.246.2.20, seq=3 dist=13 time=122.345 ms
  unicast from 132.246.2.20, seq=4 dist=13 time=122.334 ms
multicast from 132.246.2.20, seq=4 dist=13 time=122.371 ms
  unicast from 132.246.2.20, seq=5 dist=13 time=122.360 ms
multicast from 132.246.2.20, seq=5 dist=13 time=122.384 ms

--- 132.246.2.20 ssmping statistics ---
5 packets transmitted, time 5003 ms
unicast:
   5 packets received, 0% packet loss
   rtt min/avg/max/std-dev = 122.098/122.286/122.360/0.394 ms
multicast:
   4 packets received, 0% packet loss since first mc packet (seq 2)
   recvd
   rtt min/avg/max/std-dev = 122.345/123.040/125.061/1.192 ms
```

What does the output tell us?
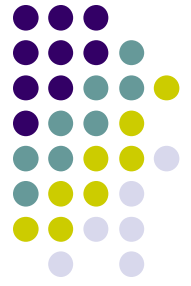
- 13 unicast hops from source, also 13 for multicast
  - Multicast is likely to follow same path as multicast
  - Note that with SSM we immediately join shortest path tree
- Multicast RTTs are slightly larger and vary more
  - The difference in unicast and multicast RTT shows one way difference for unicast and multicast replies, since they are replies to the same request packet
- The multicast tree is not ready for first multicast reply, ok for 2nd
- No unicast loss, no multicast loss after tree established

There is also asmping

- asmping is very similar to ssmping
- asmping is ASM version of ssmping
- A tool for testing multicast connectivity
- Behavior is a bit like normal ping
- A server must run ssmpingd (latest version supports asmping)
- A client pings a server by sending a unicast asmping query
- The server replies with both unicast and multicast asmping replies
- In this way a client can check that it can receive ASM from the server
  - And also parameters like delay, number of router hops etc.

asmping example
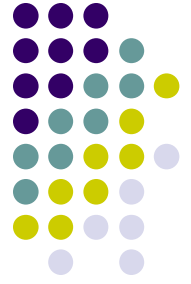
```
sv@xiang /tmp $ asmping 224.3.4.234 ssmping.uninett.no
ssmping joined (S,G) = (158.38.63.22,224.3.4.234)
pinging S from 152.78.64.13
  unicast from 158.38.63.22, seq=1 dist=23 time=57.261 ms
  unicast from 158.38.63.22, seq=2 dist=23 time=56.032 ms
multicast from 158.38.63.22, seq=2 dist=7 time=207.876 ms
multicast from 158.38.63.22, seq=2 dist=7 time=208.567 ms (DUP!)
  unicast from 158.38.63.22, seq=3 dist=23 time=56.852 ms
multicast from 158.38.63.22, seq=3 dist=21 time=70.352 ms
multicast from 158.38.63.22, seq=4 dist=21 time=57.208 ms
  unicast from 158.38.63.22, seq=4 dist=23 time=57.910 ms
  unicast from 158.38.63.22, seq=5 dist=23 time=56.206 ms
multicast from 158.38.63.22, seq=5 dist=21 time=57.375 ms
```

Summary
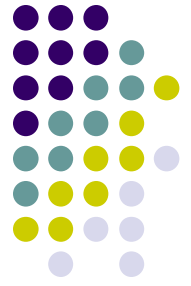
- Tools and further documentation available from http://www.venaas.no/multicast/ssmping/
- You can deploy your own server, or check that you can receive from the public servers listed at the above URL
- Supports both IPv4 and IPv6
- Tested on many UNIX platforms (Linux, Solaris, various BSD, Mac OS X) and Windows XP and Vista
  - Not all platforms have SSM support needed by ssmping client
- Also a tool called mcfirst as part of ssmping package
  - It simply joins specified group (, source) and port and exits when one packet is received
  - Can optionally specify number of packets or time in seconds
  - Prints out info on sources and rates