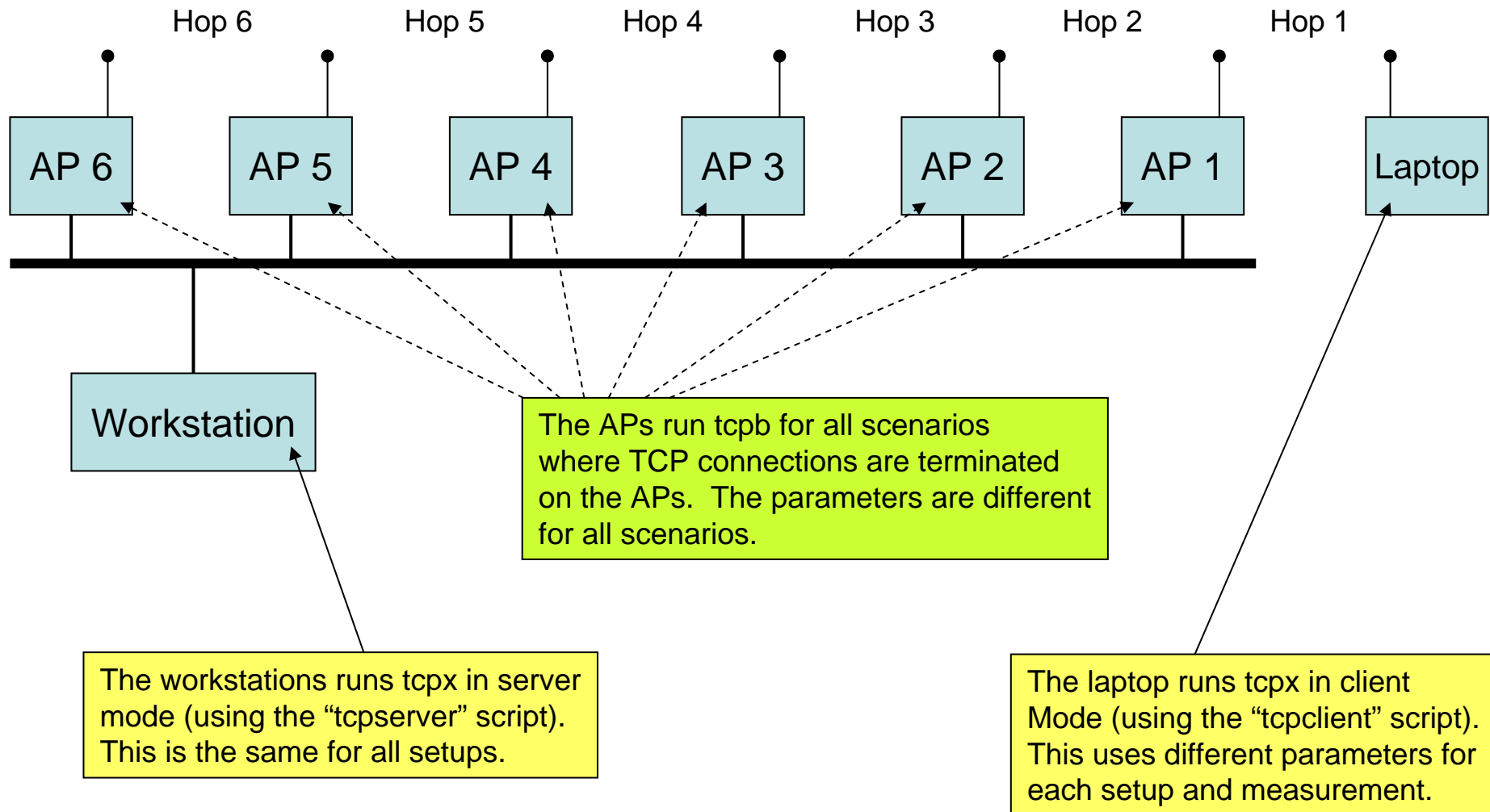


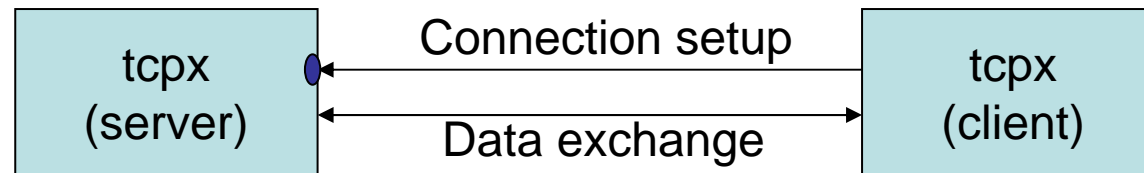
Measurement Scenarios

AP Chain Ad-hoc Measurements

Basic setup and Software Components



tcpx Configuration



- The tcpx server side always listens on port 9000 for incoming connections.
- It logs everything to a log file (-V) the name of which is received from the tcpx client (-F)
- Segment size will be 1460 bytes on both sides (-s 1460)
- This yields the command line:

Server: `tcpx -s -p 9000 -s 1460 -V -F`

- This will be called in an endless loop by the server script

- The tcpx client always connects to port 9000.
- The target IP address depends on the scenario.
- The traffic pattern spec defines whether the client sends (-r 1460:0) or receives (-r 0:1460) or both (-r 1460:1460)
- Each measurement runs for 60s (-T 60).
- The client defines the logfile name (-f) and sends it to the server (-F).
- The client also logs everything (-V)

Client: `tcpx -h ipaddr -p 9000 -s 1460 -f log-id -F -V -T 60 -r <traffic-spec>`

tcpx Operation

Traffic spec:

-r X:Y:TS:TC

May be provided any number of times. Will be cycled endlessly.

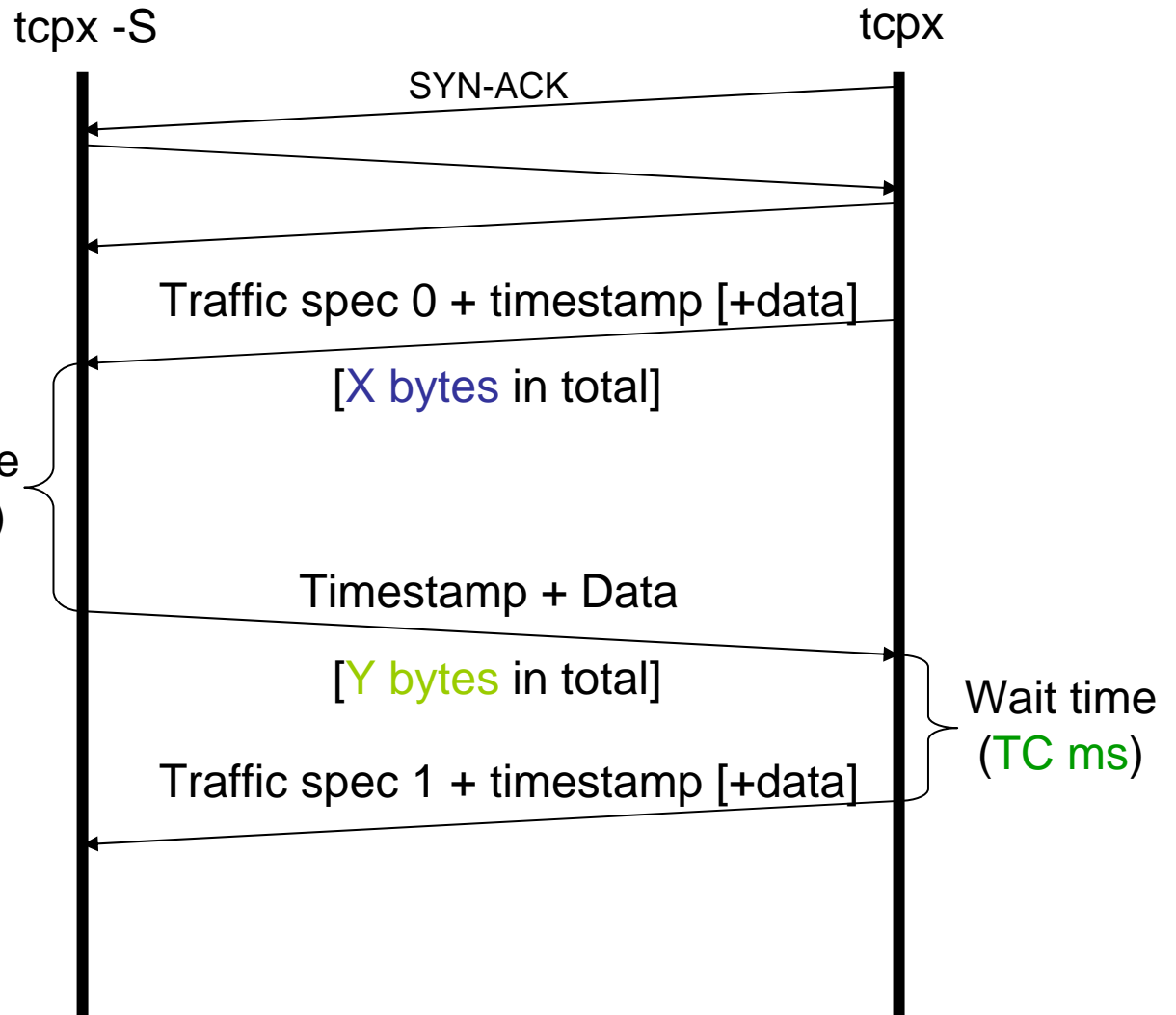
Wait time (TS ms)

-r 1460:0:0:TC

Send only from client to server.

-r 0:1460:TS:0

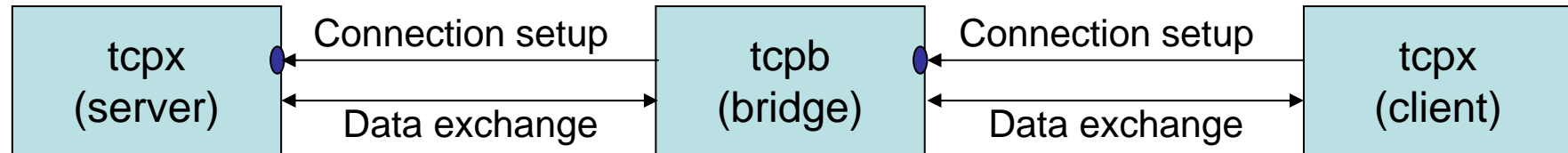
Send only from server to client.



Measurement Scenarios (1)

- tcpx operation across 1 – 6 wireless hops:
 - 1 only
 - 1 – 2
 - 1 – 2 – 3
 - 1 – 2 – 3 – 4
 - 1 – 2 – 3 – 4 – 5
 - 1 – 2 – 3 – 4 – 5 – 6
- Initially, three measurements settings each:
 - Client to server (-r 1460:0)
 - Server to client (-r 0:1460)
 - Bidirectional (-r 1460:1460)

tcpb Configuration



- tcpb always listens on a predefined port for incoming connections (-l port); this should be 9000 so that we use the same port number for all connection establishment. Incoming connections are from the tcpx client or another tcpb
- Upon accepting an incoming connection, tcpb always creates an outgoing connection to the next hop (which may be another tcpb or the final tcpx server). The next hop is specified by the options -h <host> and -l <port>. Again, port will be 9000.
- If the connection to one side is terminated, so will be the other one.
- tcpb allows modifying the traffic flow in two ways: by means of delaying incoming traffic – which causes it to wait <delay> ms before each transmission and is specified by -d <delay>
- Note that this will ultimately create some backpressure on the tcpx client.
- tcpx also allow bundling incoming traffic. Rather than forwarding each piece of incoming data immediately, it may collect <block-size> bytes (specified via the option -s).
- Note that this requires that each transmitting endpoint MUST send exactly <block-size> bytes, otherwise the connection will stall

tcpb: `tcpb -h <next-hop-host> -p 9000 -l 9000 -q [-s <block-size>] -d <delay>`

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