OpenVPN Traffic

Exploratory Data Analysis: baseline traffic

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Contents

Experiment description

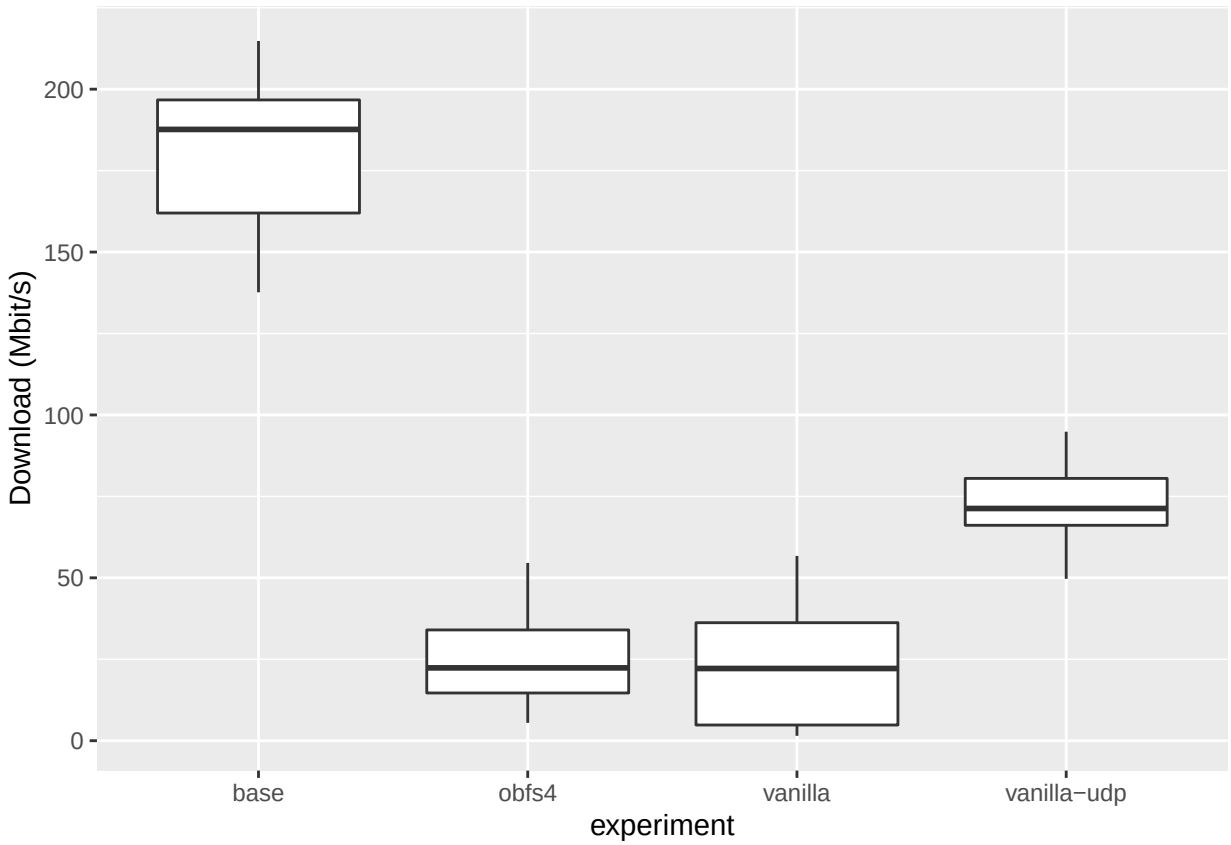
The following measurements were taken against an ndt server (located in amsterdam, oracle cloud).

Chosen OpenVPN gateway: Paris (RiseupVPN).

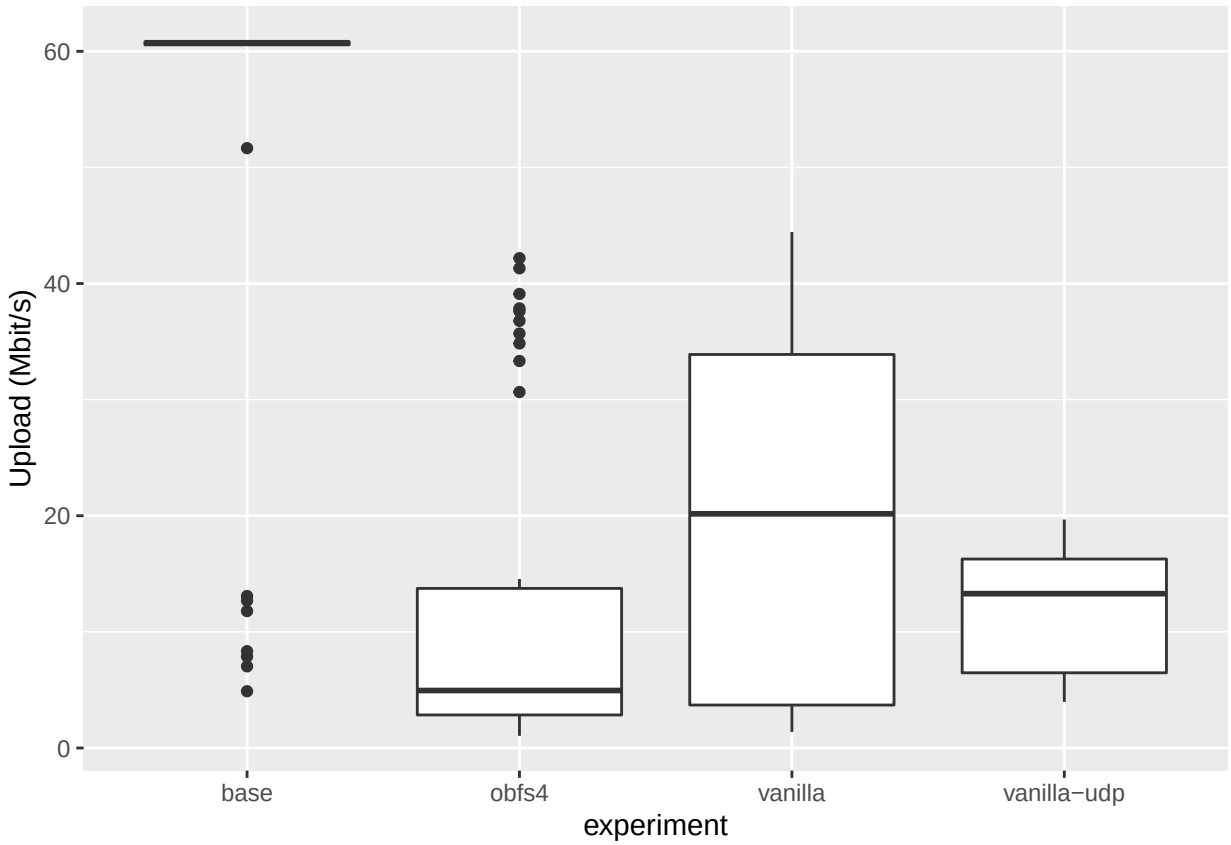
- base: residential connection (fiber)
- vanilla: openvpn (tcp mode).
- vanilla-udp: openvpn (udp mode).
- obfs4: openvpn (tcp) over obfs4 (bridge in amsterdam).

Boxplots

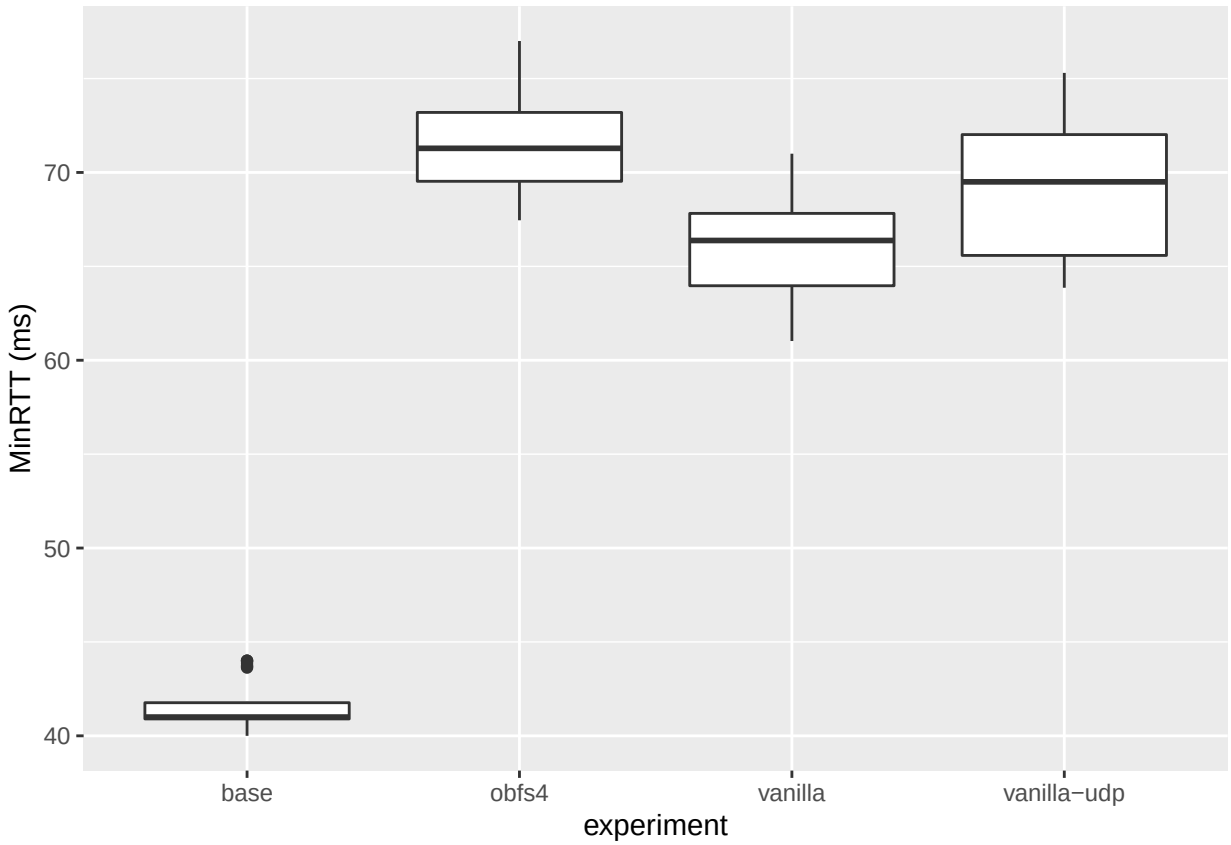
```
library(ggplot2)
d  <- read.csv('../data/data.csv')
ggplot(data=d, aes(x=exp, y=down)) + geom_boxplot() +
    xlab("experiment") + ylab("Download (Mbit/s)")
```



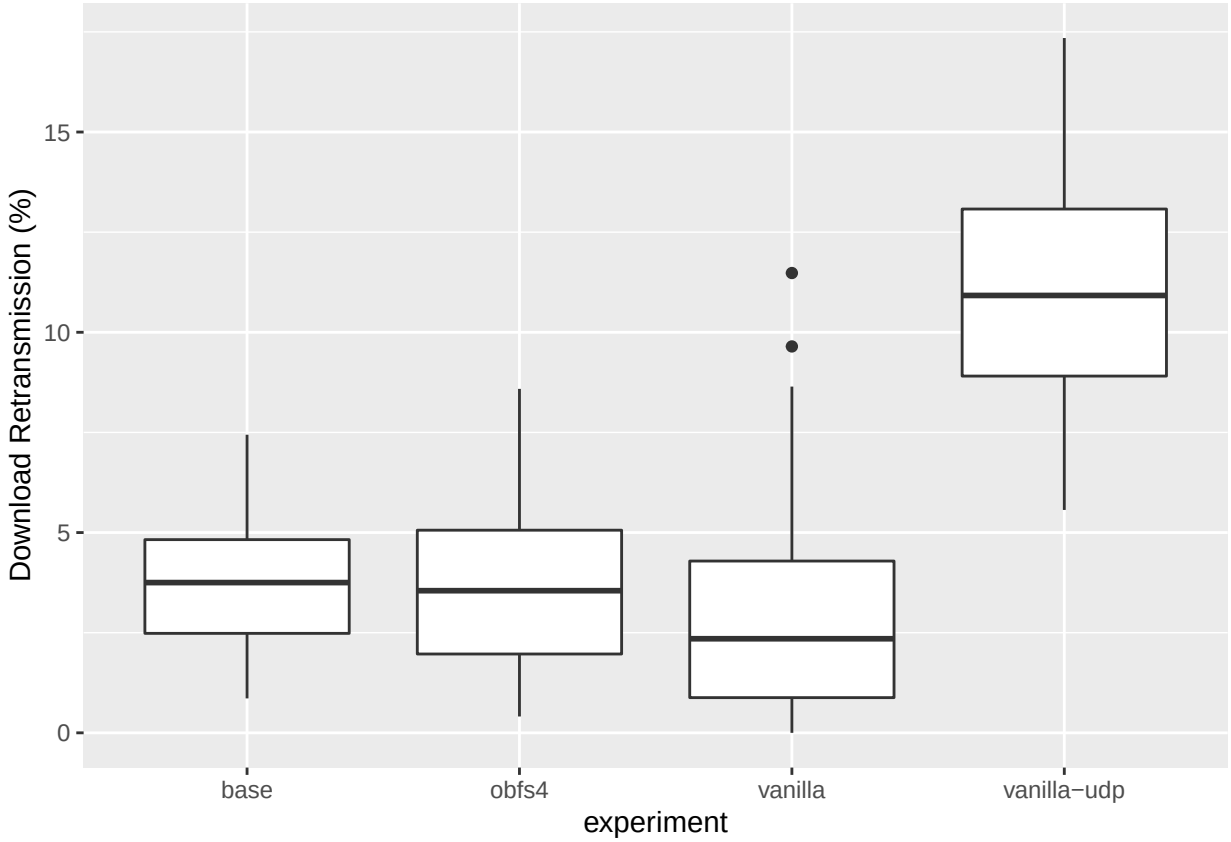

```
ggplot(data=d, aes(x=exp, y=up)) + geom_boxplot() +
    xlab("experiment") + ylab("Upload (Mbit/s)")
```




```
ggplot(data=d, aes(x=exp, y=minrtt)) + geom_boxplot() +
    xlab("experiment") + ylab("MinRTT (ms)")
```

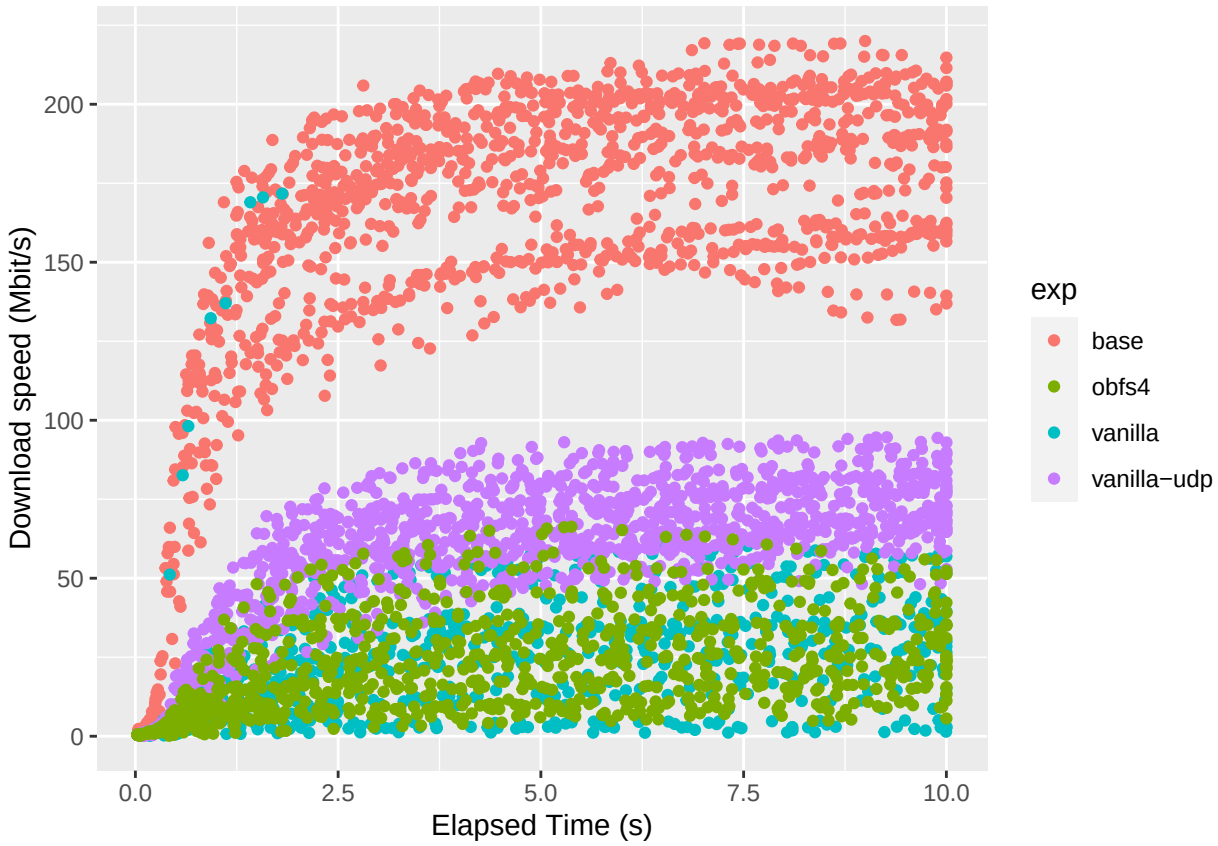



```
ggplot(data=d, aes(x=exp, y=retr)) + geom_boxplot() +
    xlab("experiment") + ylab("Download Retransmission (%)")
```

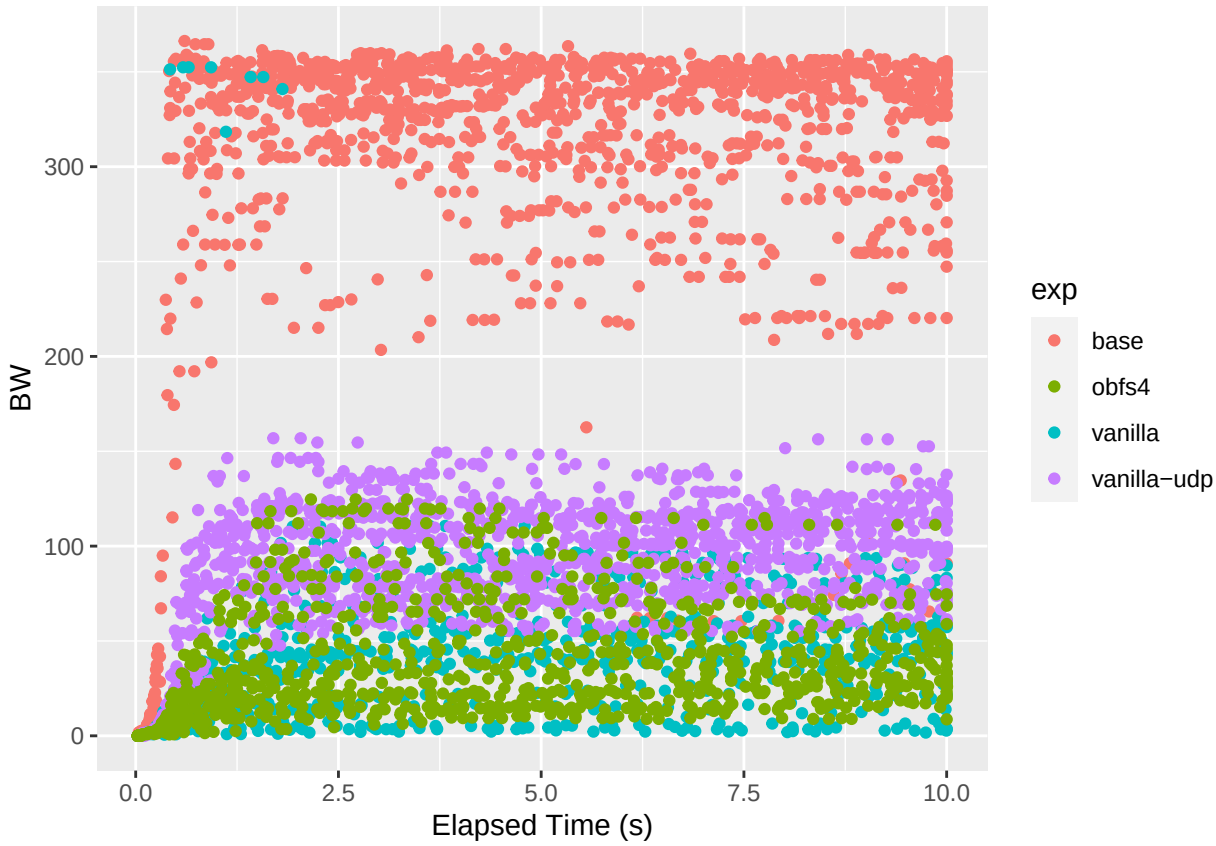


Metrics

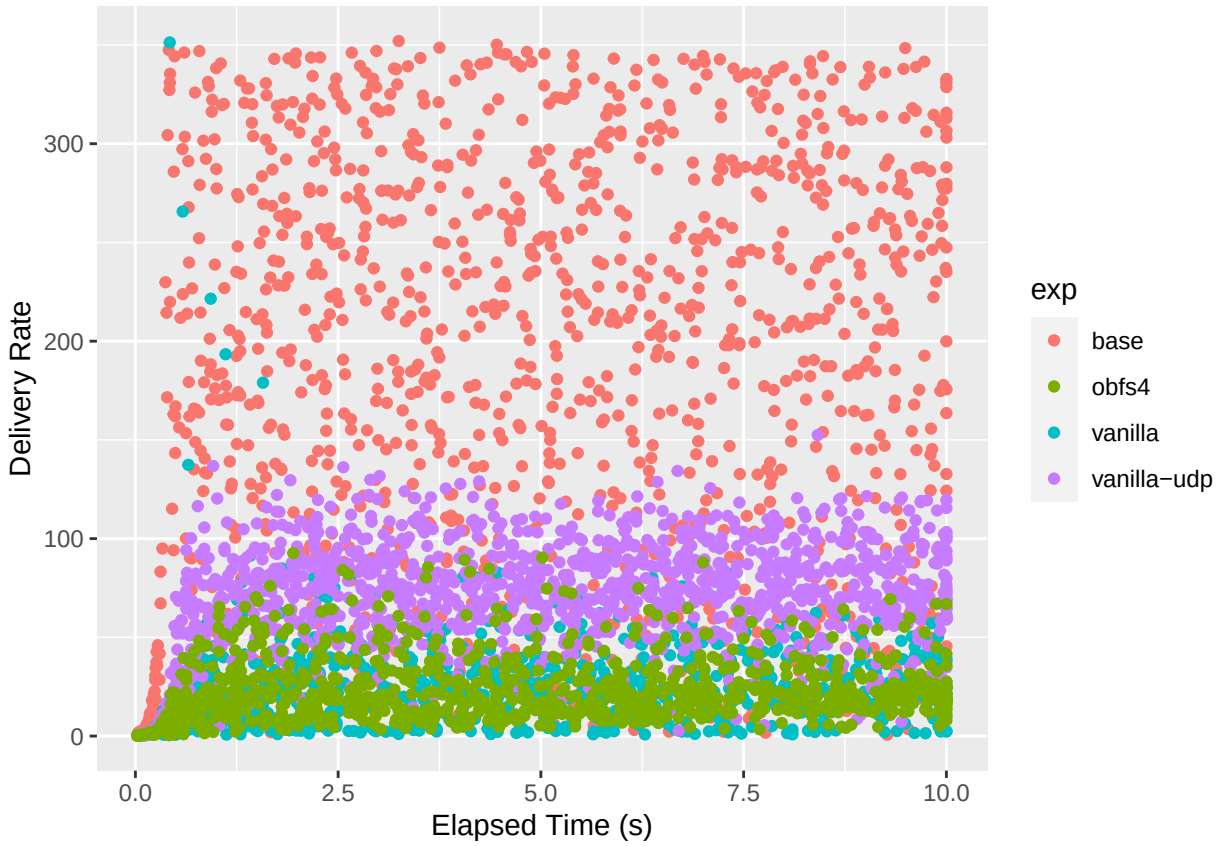
```
bw  <- read.csv('../data/bw.csv')
ggplot(data=bw, aes(x=time, y=speed, color=exp)) +
    geom_point() +
    labs(x = "Elapsed Time (s)", y = "Download speed (Mbit/s)")
```



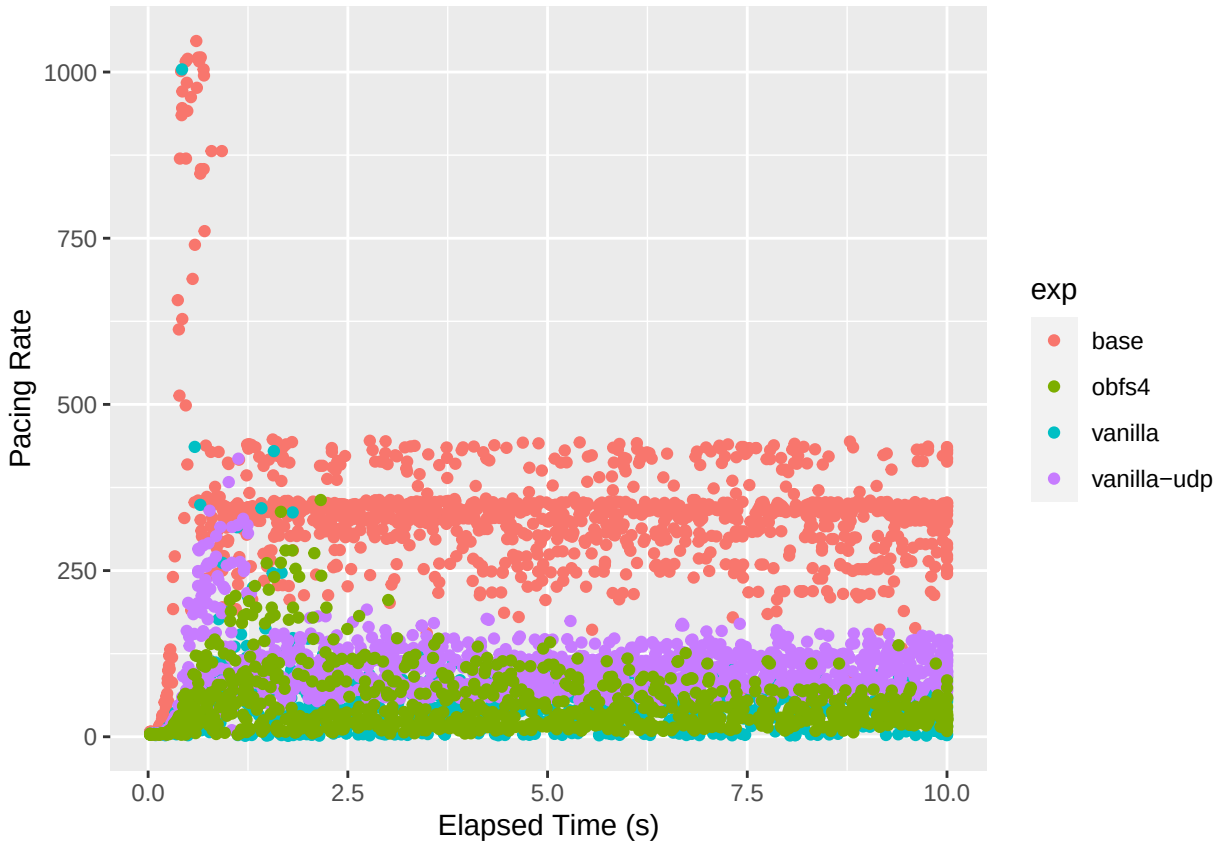

```
ggplot(data=bw, aes(x=time, y=bw, color=exp)) +
    geom_point() +
    labs(x = "Elapsed Time (s)", y = "BW")
```




```
ggplot(data=bw, aes(x=time, y=delivery_rate, color=exp)) +
    geom_point() +
    labs(x = "Elapsed Time (s)", y = "Delivery Rate")
```




```
ggplot(data=bw, aes(x=time, y=pacing_rate, color=exp)) +
    geom_point() +
    labs(x = "Elapsed Time (s)", y = "Pacing Rate")
```


Pacing Rate
1000
750
500
250
0
0.0
2.5
5.0
7.5
10.0
Elapsed Time (s)
exp
base
obfs4
vanilla
vanilla−udp