

# Anhang 4

## Graphische Darstellung der Paketloss Messungen

```
setwd("/home/lisa/Darmstadt/05_Speicher und Datennetze IoT/Praktikum/Git/mqtt-qos-rountrip/R_Analysis/05_Paketloss_Messungen")
options(digits.secs=3) # needs to be set from time to time - otherwise R doesn't allow for ms
library("data.table", lib.loc=~ /R/x86_64-pc-linux-gnu-library/3.4")
library("h2o", lib.loc=~ /R/x86_64-pc-linux-gnu-library/3.4")
library("tidyr", lib.loc=~ /R/x86_64-pc-linux-gnu-library/3.4")
library("plyr")
library(kableExtra)
```

```
load("./latenzPL1proz.Rda")
load("./latenzPL5proz.Rda")
load("./latenzPL10proz.Rda")
load("./latenzPL15proz.Rda")
load("./latenzPL20proz.Rda")
load("./latenzPL25proz.Rda")
load("./latenzPL30proz.Rda")
```

```
#files <- list.files(pattern = "*bps.Rda", full.names = TRUE, recursive = FALSE)
files <- c("latenzPL1proz", "latenzPL5proz", "latenzPL10proz", "latenzPL15proz", "latenzPL20proz", "latenzPL25proz", "latenzPL30proz")
```

Zusammenfügen eines großen Datensatzes aller Paketloss-files

```
latenzPL1proz$PL_Proz <- 1
latenzPL5proz$PL_Proz <- 5
latenzPL10proz$PL_Proz <- 10
latenzPL15proz$PL_Proz <- 15
latenzPL20proz$PL_Proz <- 20
latenzPL25proz$PL_Proz <- 25
latenzPL30proz$PL_Proz <- 30
```

```
Ploss_Logs <- rbind(latenzPL1proz, latenzPL5proz, latenzPL10proz, latenzPL15proz, latenzPL20proz, latenzPL25proz, latenzPL30proz)
```

```
Ploss_Logs$Byte<-Ploss_Logs$Size
Ploss_Logs$Byte[Ploss_Logs$Byte == "1Byte"] <- 1
Ploss_Logs$Byte[Ploss_Logs$Byte == "10Byte"] <- 10
Ploss_Logs$Byte[Ploss_Logs$Byte == "100Byte"] <- 100
Ploss_Logs$Byte[Ploss_Logs$Byte == "1KByte"] <- 1000
Ploss_Logs$Byte[Ploss_Logs$Byte == "1500Byte"] <- 1500
Ploss_Logs$Byte[Ploss_Logs$Byte == "10KByte"] <- 10000
Ploss_Logs$Byte[Ploss_Logs$Byte == "100KByte"] <- 100000
Ploss_Logs$Byte[Ploss_Logs$Byte == "500KByte"] <- 500000
Ploss_Logs$Byte[Ploss_Logs$Byte == "1MByte"] <- 1000000
Ploss_LogsSum <- summary(Ploss_Logs)
```

```
#Ploss_LogsAgg <- aggregate(Ploss_Logs$rtt ~ Ploss_Logs$QoS+Ploss_Logs$Size+Ploss_Logs$Byte, Ploss_Logs, mean)
Ploss_LogsAgg <- aggregate(Ploss_Logs$rtt ~ Ploss_Logs$QoS+ Ploss_Logs$PL_Proz, Ploss_Logs, mean)
```

```
#Ploss_LogsAgg$`tcLogs$Byte`<-as.numeric(Ploss_LogsAgg$`tcLogs$Byte`)
#Ploss_LogsAgg<-Ploss_LogsAgg[order(Ploss_LogsAgg$`tcLogs$Byte`),]
```

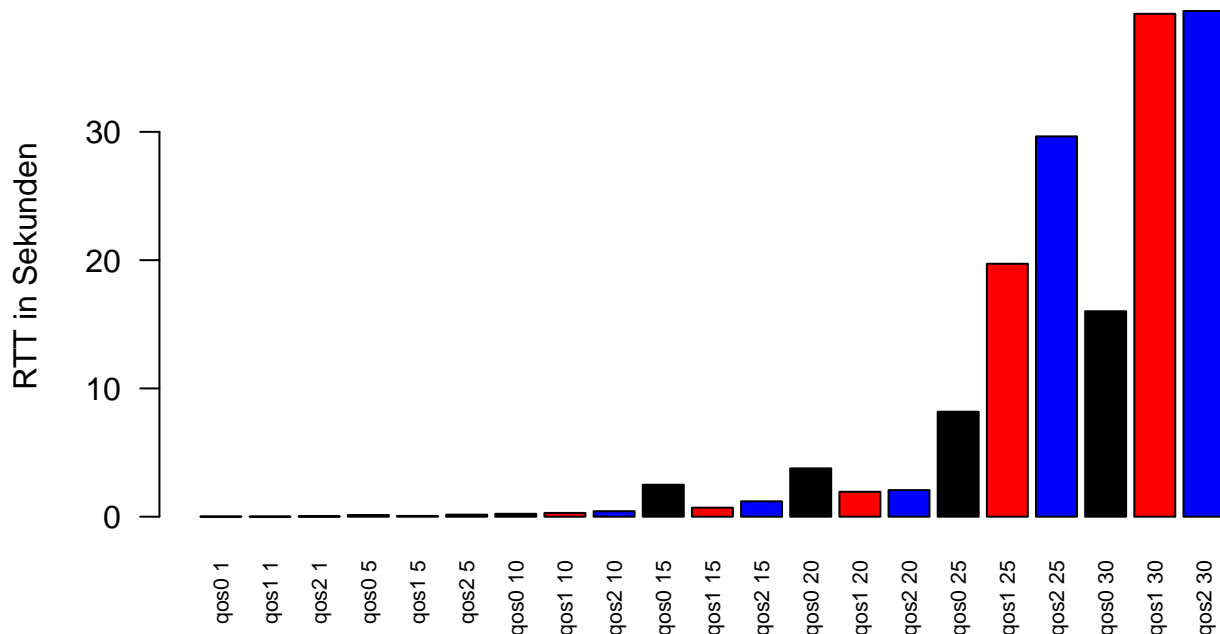
```
Ploss_LogsAgg %>%
  kable() %>%
```

```
kable_styling()
```

PLoss_Logs\$QoS	PLoss_Logs\$PL_Proz	PLoss_Logs\$rtt
qos0	1	0.0098475
qos1	1	0.0084068
qos2	1	0.0367627
qos0	5	0.1312034
qos1	5	0.0587966
qos2	5	0.1579322
qos0	10	0.2266102
qos1	10	0.2934068
qos2	10	0.4273559
qos0	15	2.4896271
qos1	15	0.7028474
qos2	15	1.2001356
qos0	20	3.7678276
qos1	20	1.9415424
qos2	20	2.0728983
qos0	25	8.1830323
qos1	25	19.7166666
qos2	25	29.6470833
qos0	30	16.0160500
qos1	30	39.2010000
qos2	30	39.4201305

```
PLoss_LogsAgg$Names <- paste(PLoss_LogsAgg$`PLoss_Logs$QoS`, PLoss_LogsAgg$`PLoss_Logs$PL_Proz`)
#PLoss_LogsAgg<-PLoss_LogsAgg[order(PLoss_LogsAgg$`tcLogs$Byte`),]
barplot(PLoss_LogsAgg$`PLoss_Logs$rtt`, main = "RTT nach QoS und Max Traffic", col = c("black", "red", "blue"))
```

## RTT nach QoS und Max Traffic



```
#####
# Aufsplittung nach PL #
#####

Ploss_Logs_1PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 1,]
Ploss_Logs_5PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 5,]
Ploss_Logs_10PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 10,]
Ploss_Logs_15PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 15,]
Ploss_Logs_20PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 20,]
Ploss_Logs_25PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 25,]
Ploss_Logs_30PL<-Ploss_Logs[Ploss_Logs$PL_Proz == 30,]

#####
# Aufsplittung PL nach QoS #
#####

Ploss_Logs_1PL_QoS0<-Ploss_Logs_1PL[Ploss_Logs_1PL$QoS == "qos0",]
Ploss_Logs_1PL_QoS1<-Ploss_Logs_1PL[Ploss_Logs_1PL$QoS == "qos1",]
Ploss_Logs_1PL_QoS2<-Ploss_Logs_1PL[Ploss_Logs_1PL$QoS == "qos2",]

Ploss_Logs_5PL_QoS0<-Ploss_Logs_5PL[Ploss_Logs_5PL$QoS == "qos0",]
Ploss_Logs_5PL_QoS1<-Ploss_Logs_5PL[Ploss_Logs_5PL$QoS == "qos1",]
Ploss_Logs_5PL_QoS2<-Ploss_Logs_5PL[Ploss_Logs_5PL$QoS == "qos2",]

Ploss_Logs_10PL_QoS0<-Ploss_Logs_10PL[Ploss_Logs_10PL$QoS == "qos0",]
Ploss_Logs_10PL_QoS1<-Ploss_Logs_10PL[Ploss_Logs_10PL$QoS == "qos1",]
Ploss_Logs_10PL_QoS2<-Ploss_Logs_10PL[Ploss_Logs_10PL$QoS == "qos2",]

Ploss_Logs_15PL_QoS0<-Ploss_Logs_15PL[Ploss_Logs_15PL$QoS == "qos0",]
Ploss_Logs_15PL_QoS1<-Ploss_Logs_15PL[Ploss_Logs_15PL$QoS == "qos1",]
Ploss_Logs_15PL_QoS2<-Ploss_Logs_15PL[Ploss_Logs_15PL$QoS == "qos2",]

Ploss_Logs_20PL_QoS0<-Ploss_Logs_20PL[Ploss_Logs_20PL$QoS == "qos0",]
Ploss_Logs_20PL_QoS1<-Ploss_Logs_20PL[Ploss_Logs_20PL$QoS == "qos1",]
Ploss_Logs_20PL_QoS2<-Ploss_Logs_20PL[Ploss_Logs_20PL$QoS == "qos2",]

Ploss_Logs_25PL_QoS0<-Ploss_Logs_25PL[Ploss_Logs_25PL$QoS == "qos0",]
Ploss_Logs_25PL_QoS1<-Ploss_Logs_25PL[Ploss_Logs_25PL$QoS == "qos1",]
Ploss_Logs_25PL_QoS2<-Ploss_Logs_25PL[Ploss_Logs_25PL$QoS == "qos2",]

Ploss_Logs_30PL_QoS0<-Ploss_Logs_30PL[Ploss_Logs_30PL$QoS == "qos0",]
Ploss_Logs_30PL_QoS1<-Ploss_Logs_30PL[Ploss_Logs_30PL$QoS == "qos1",]
Ploss_Logs_30PL_QoS2<-Ploss_Logs_30PL[Ploss_Logs_30PL$QoS == "qos2",]

#rttQoS0<-get(namesTime[1])
#rttQoS1<-get(namesTime[2])
#rttQoS2<-get(namesTime[3])

par(mfrow = c(1, 1))
#####
# 1% #
#####
plot(Ploss_Logs_1PL_QoS0$id, Ploss_Logs_1PL_QoS0$rtt, main = "RTT Paketloss 1% (10KByte, 1PproSek)",
     ylim = c(0, 0.3), ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
```

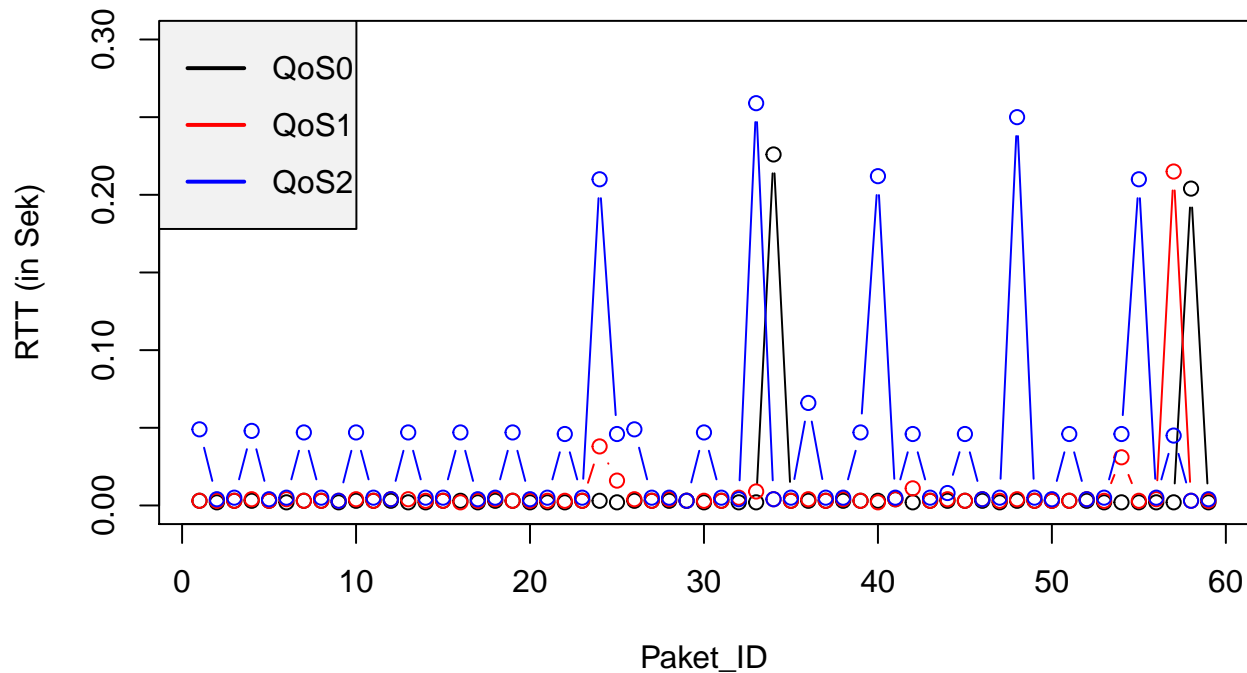
```

points(PLoss_Logs_1PL_QoS1$id, PLoss_Logs_1PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_1PL_QoS2$id, PLoss_Logs_1PL_QoS2$rtt, col = "blue", type = "b")

legend("topleft", c("QoS0", "QoS1", "QoS2"), text.width = 4,
      col = c("black", "red", "blue"),
      text.col = "black", cex = 1, lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")

```

### RTT Paketloss 1% (10KByte, 1PproSek)



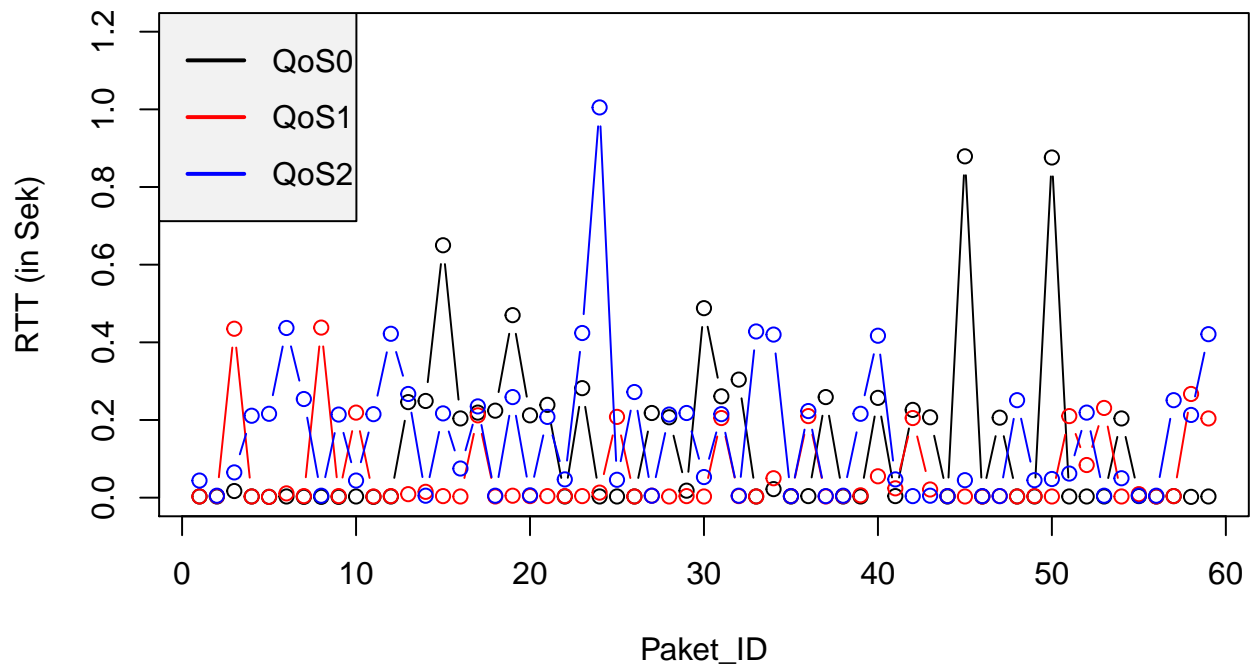
```

#####
# 5% #
#####
plot(PLoss_Logs_5PL_QoS0$id, PLoss_Logs_5PL_QoS0$rtt, main = "RTT Paketloss 5% (10KByte, 1PproSek)",
     ylim = c(0, 1.2), ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_5PL_QoS1$id, PLoss_Logs_5PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_5PL_QoS2$id, PLoss_Logs_5PL_QoS2$rtt, col = "blue", type = "b")

legend("topleft", c("QoS0", "QoS1", "QoS2"), text.width = 4,
      col = c("black", "red", "blue"),
      text.col = "black", cex = 1, lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")

```

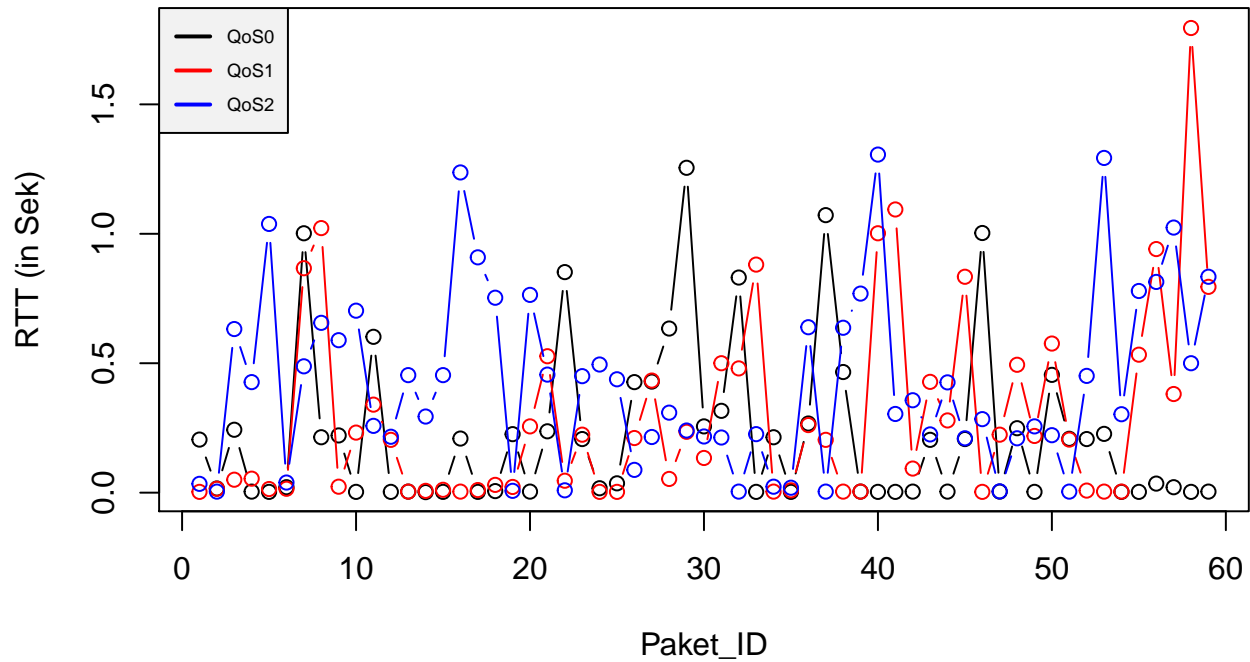
## RTT Paketloss 5% (10KByte, 1PproSek)



```
#####
# 10% #
#####
plot(PLoss_Logs_10PL_QoS0$id, PLoss_Logs_10PL_QoS0$rtt, main = "RTT Paketloss 10% (10KByte, 1PproSek)",
     ylim = c(0,1.8), ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_10PL_QoS1$id, PLoss_Logs_10PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_10PL_QoS2$id, PLoss_Logs_10PL_QoS2$rtt, col = "blue", type = "b")

legend("topleft", c("QoS0", "QoS1", "QoS2"), text.width = 3, cex = 0.6,
      col = c("black", "red", "blue"),
      text.col = "black", lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

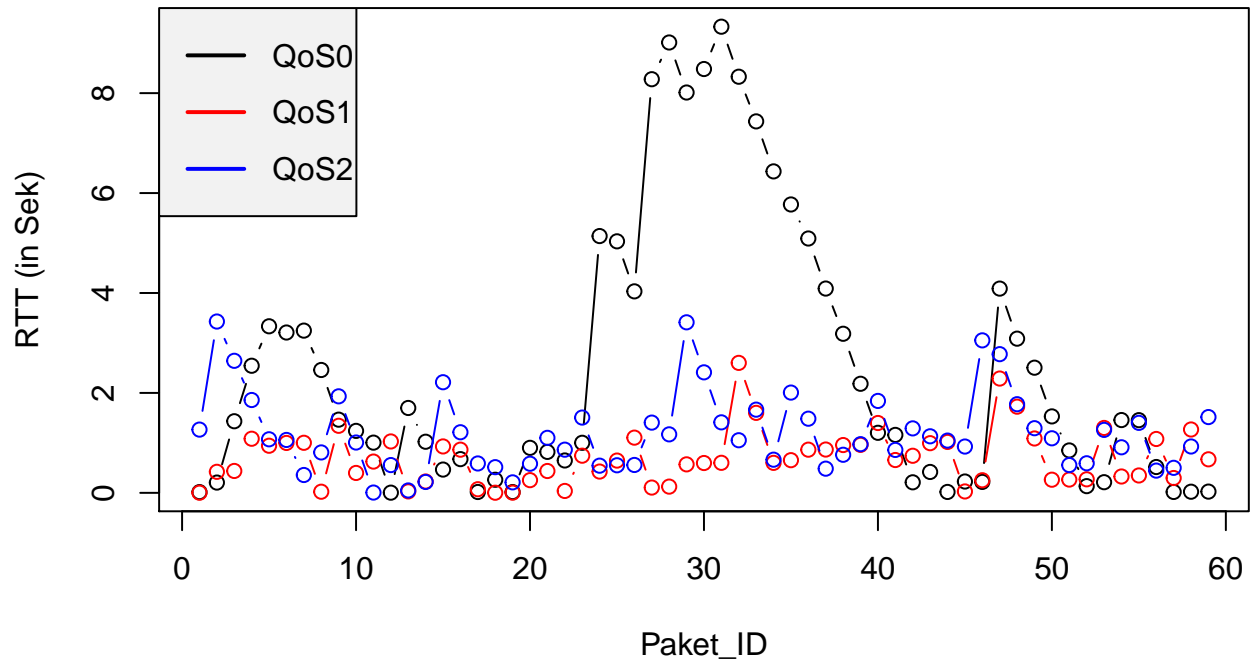
## RTT Paketloss 10% (10KByte, 1PproSek)



```
#####
# 15% #
#####
plot(PLoss_Logs_15PL_QoS0$id, PLoss_Logs_15PL_QoS0$rtt, main = "RTT Paketloss 15% (10KByte, 1PproSek)",
     ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_15PL_QoS1$id, PLoss_Logs_15PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_15PL_QoS2$id, PLoss_Logs_15PL_QoS2$rtt, col = "blue", type = "b")

legend("topleft", c("QoS0", "QoS1", "QoS2"), text.width = 4,
     col = c("black", "red", "blue"),
     text.col = "black", cex = 1, lwd = c(2, 2, 2),
     y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

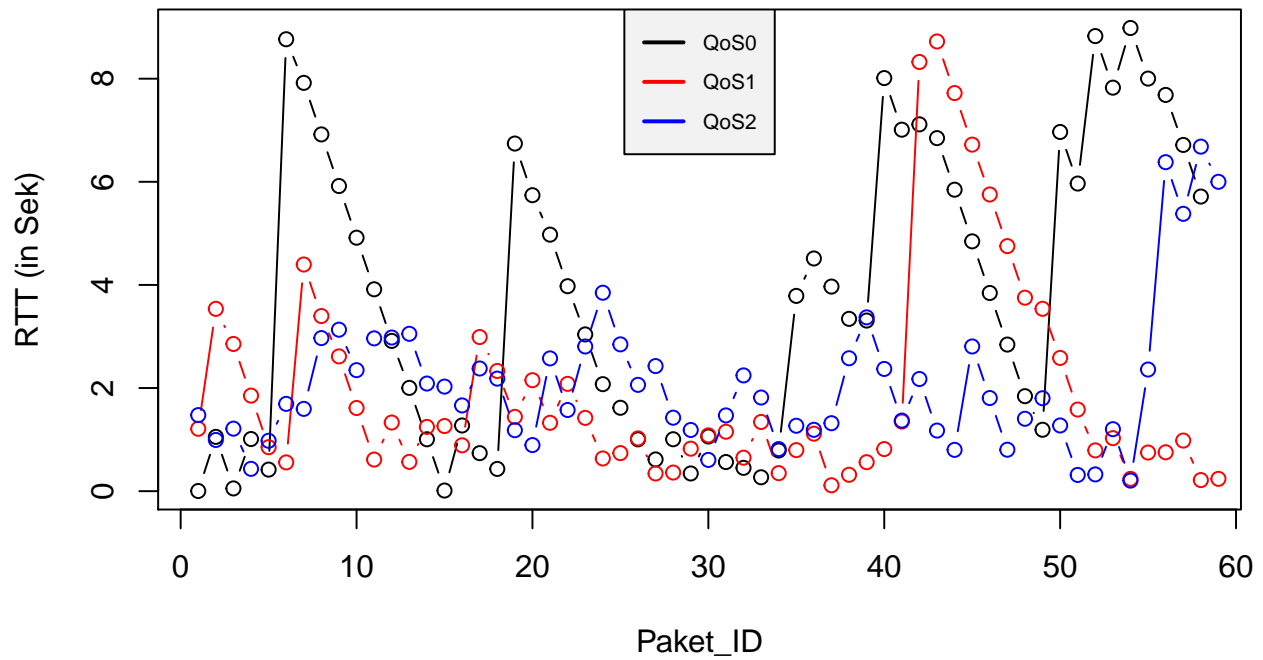
## RTT Paketloss 15% (10KByte, 1PproSek)



```
#####
# 20% #
#####
plot(PLoss_Logs_20PL_QoS0$id, PLoss_Logs_20PL_QoS0$rtt, main = "RTT Paketloss 20% (10KByte, 1PproSek)",
     ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_20PL_QoS1$id, PLoss_Logs_20PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_20PL_QoS2$id, PLoss_Logs_20PL_QoS2$rtt, col = "blue", type = "b")

legend("top", c("QoS0", "QoS1", "QoS2"), text.width = 3.5, cex = 0.7,
      col = c("black", "red", "blue"),
      text.col = "black", lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

## RTT Paketloss 20% (10KByte, 1PproSek)

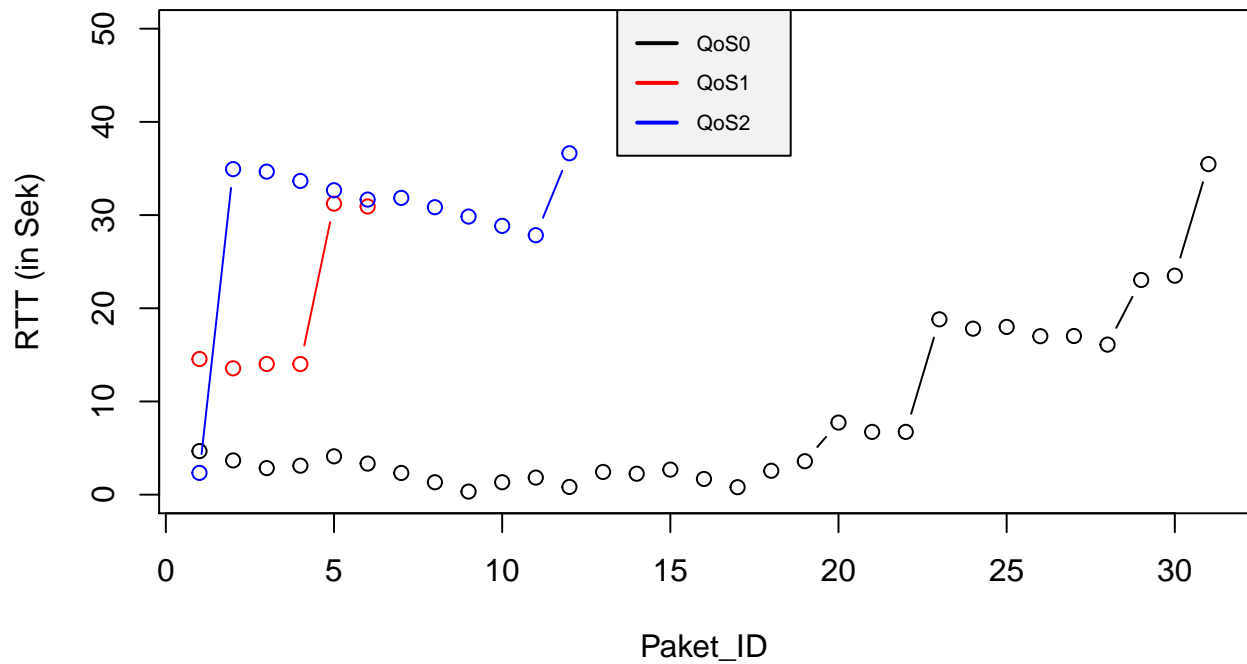


```
#####
# 25% #
#####
plot(PLoss_Logs_25PL_QoS0$id, PLoss_Logs_25PL_QoS0$rtt, main = "RTT Paketloss 25% (10KByte, 1PproSek)",
     ylim = c(0, 50), ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_25PL_QoS1$id, PLoss_Logs_25PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_25PL_QoS2$id, PLoss_Logs_25PL_QoS2$rtt, col = "blue", type = "b")

legend("top", c("QoS0", "QoS1", "QoS2"), text.width = 2.5, cex = 0.7,
      col = c("black", "red", "blue"),
      text.col = "black", lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```



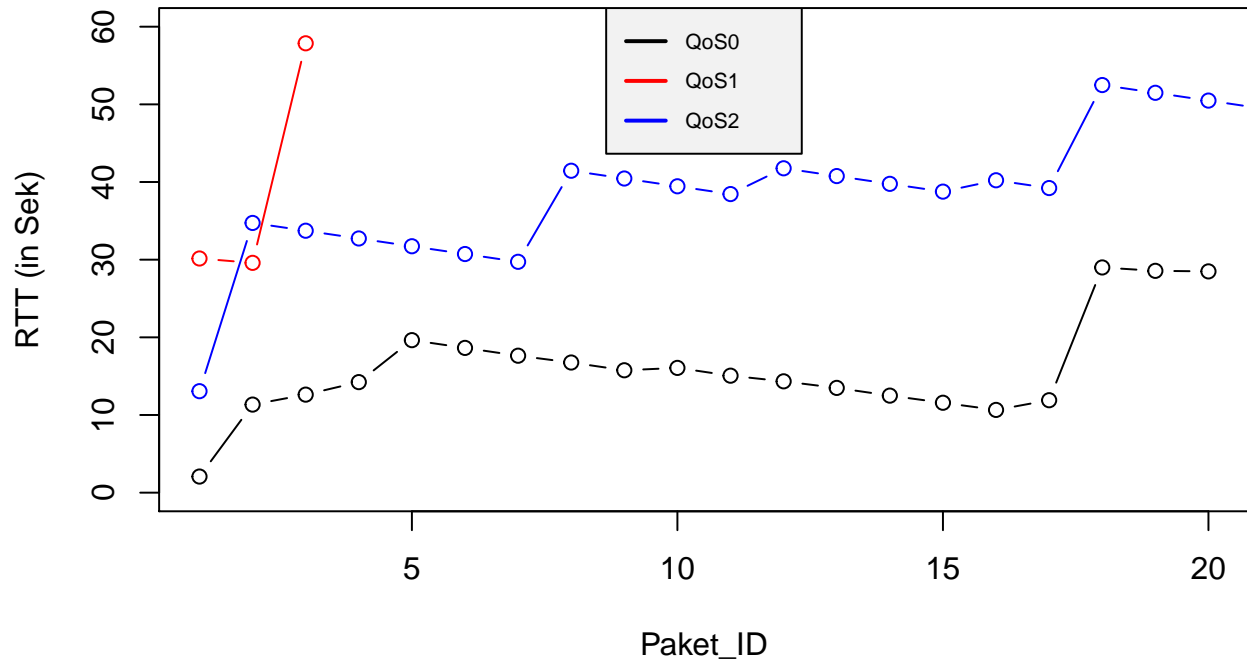
## RTT Paketloss 25% (10KByte, 1PproSek)



```
#####
# 30% #
#####
plot(PLoss_Logs_30PL_QoS0$id, PLoss_Logs_30PL_QoS0$rtt, main = "RTT Paketloss 30% (10KByte, 1PproSek)",
     ylim = c(0, 60), ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "b")
points(PLoss_Logs_30PL_QoS1$id, PLoss_Logs_30PL_QoS1$rtt, col = "red", type = "b")
points(PLoss_Logs_30PL_QoS2$id, PLoss_Logs_30PL_QoS2$rtt, col = "blue", type = "b")

legend("top", c("QoS0", "QoS1", "QoS2"), col = c("black", "red", "blue"), text.width = 2, cex = 0.7,
      text.col = "black", lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

## RTT Paketloss 30% (10KByte, 1PproSek)

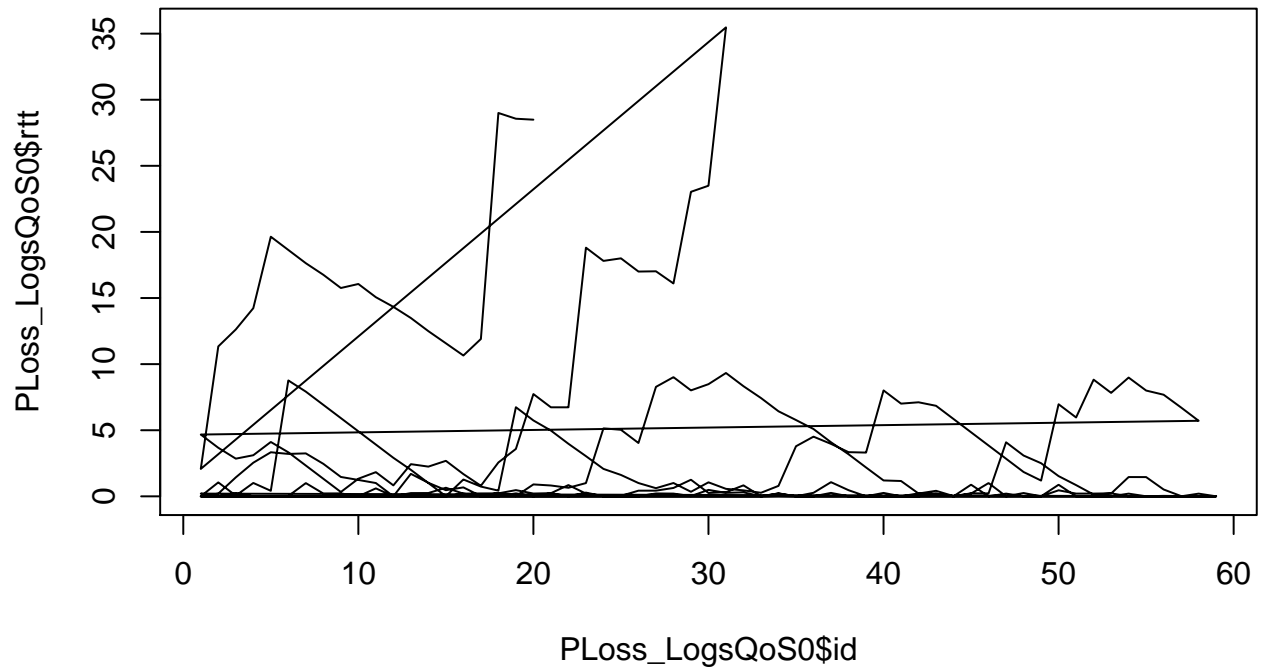


```
#####
# Aufsplittung nach QoS #
#####

Ploss_LogsQoS0<-Ploss_Logs[Ploss_Logs$QoS == "qos0",]
Ploss_LogsQoS1<-Ploss_Logs[Ploss_Logs$QoS == "qos1",]
Ploss_LogsQoS2<-Ploss_Logs[Ploss_Logs$QoS == "qos2",]

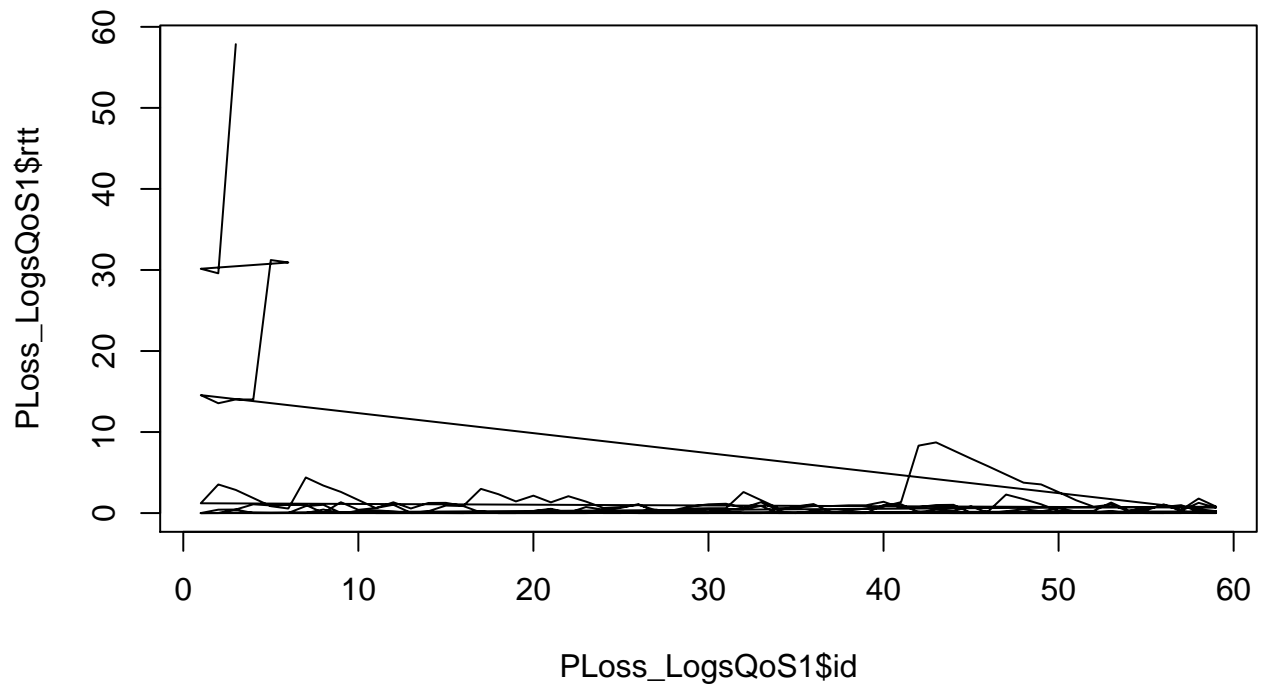
plot(Ploss_LogsQoS0$id, Ploss_LogsQoS0$rtt, type = "l", main = "RTT QoS0 (10KByte, 1PproSek)")
```

### RTT QoS0 (10KByte, 1PproSek)



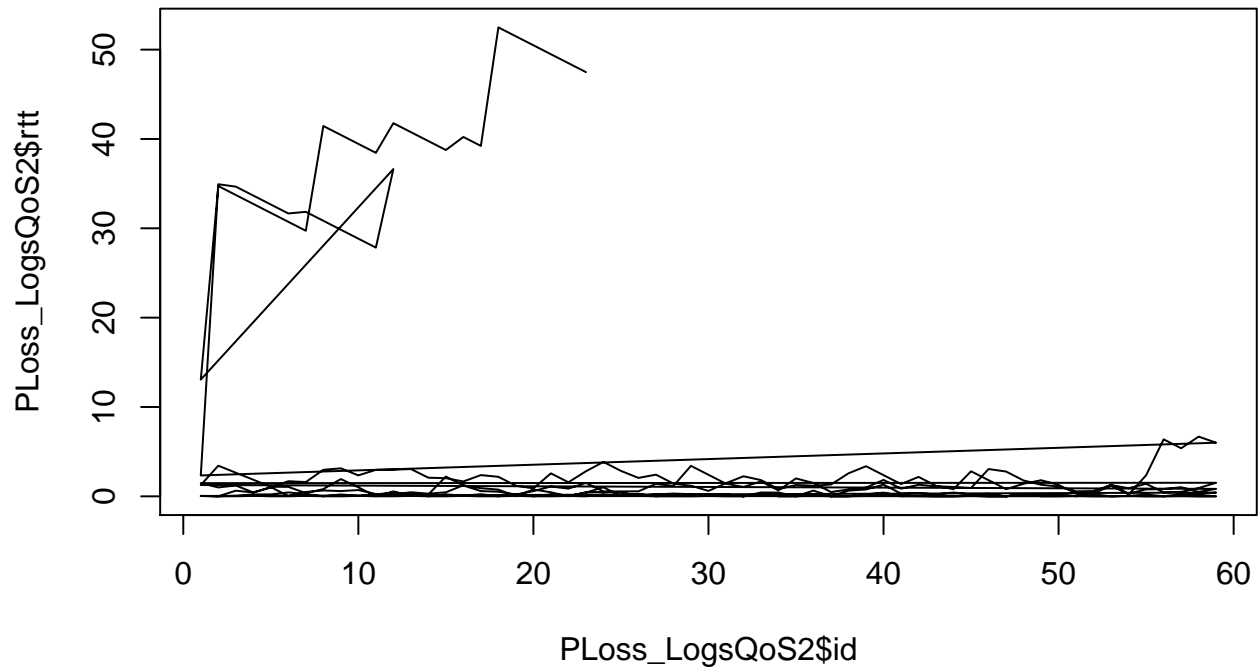
```
plot(PLoss_LogsQoS1$id, PLoss_LogsQoS1$rtt, type = "l", main = "RTT QoS1 (10KByte, 1PproSek)")
```

### RTT QoS1 (10KByte, 1PproSek)



```
plot(PLoss_LogsQoS2$id, PLoss_LogsQoS2$rtt, type = "l", main = "RTT QoS2 (10KByte, 1PproSek)")
```

## RTT QoS2 (10KByte, 1PproSek)

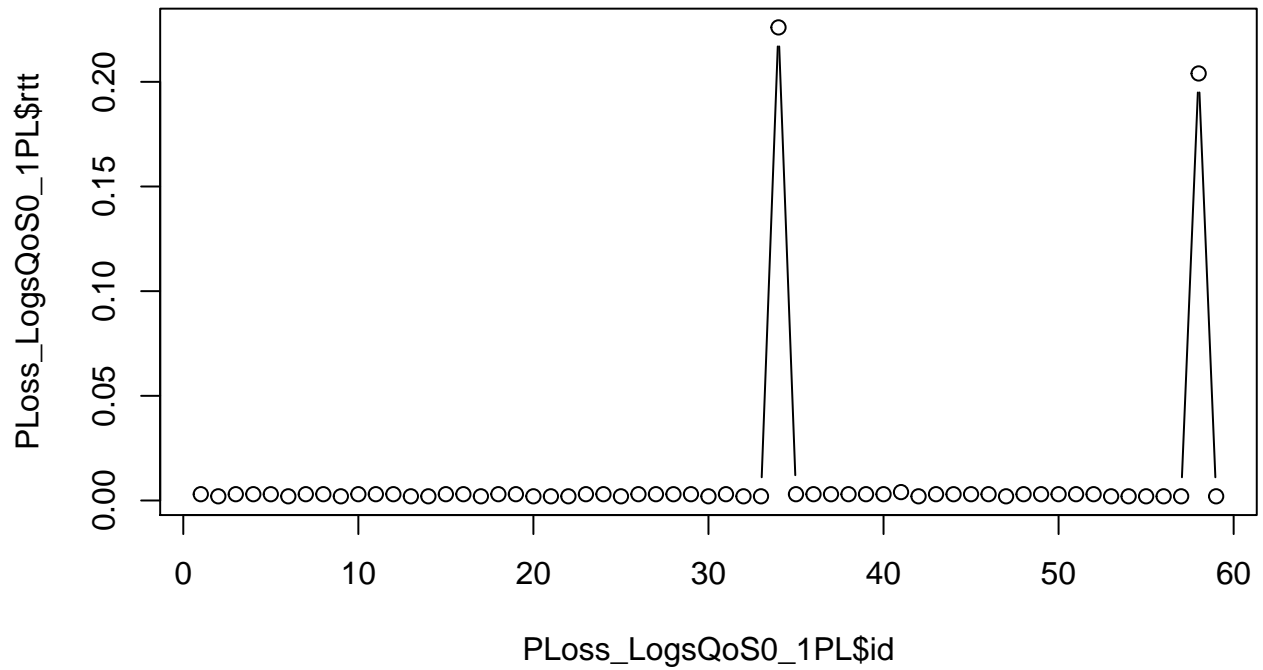


```
#####
# Aufsplittung QoS nach PL_Proz #
#####
```

```
Ploss_LogsQoS0_1PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 1,]
Ploss_LogsQoS0_5PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 5,]
Ploss_LogsQoS0_10PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 10,]
Ploss_LogsQoS0_15PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 15,]
Ploss_LogsQoS0_20PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 20,]
Ploss_LogsQoS0_25PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 25,]
Ploss_LogsQoS0_30PL<-Ploss_LogsQoS0[Ploss_LogsQoS0$PL_Proz == 30,]
```

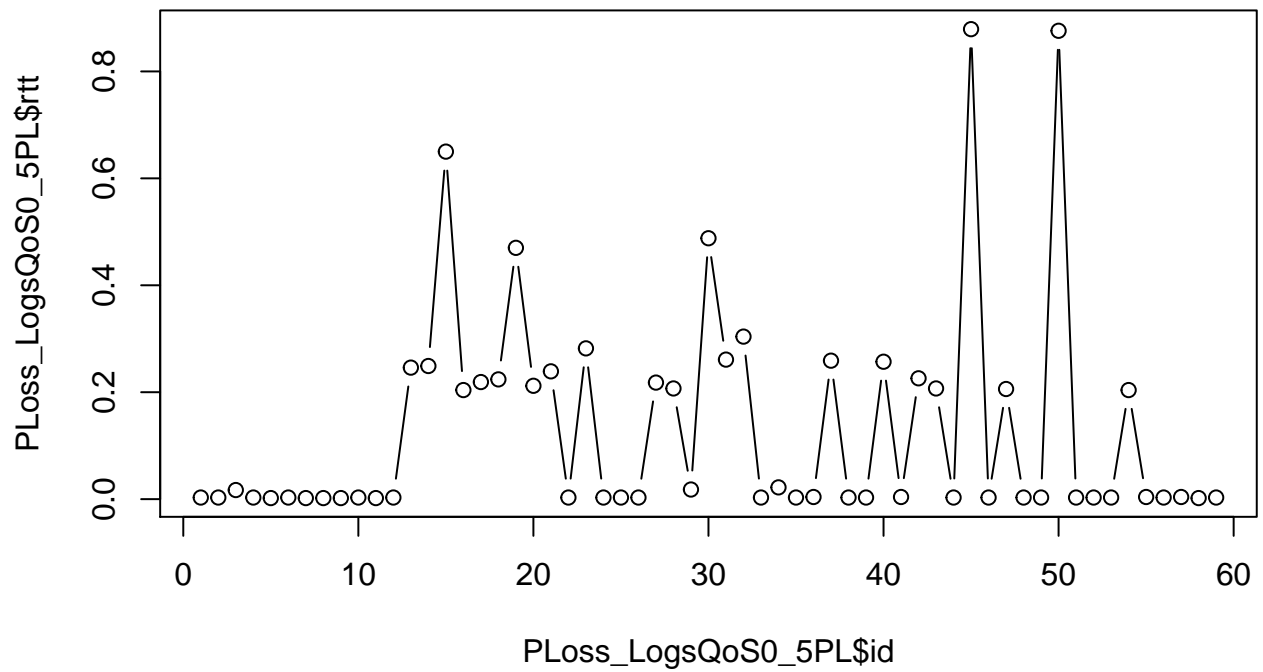
```
plot(Ploss_LogsQoS0_1PL$id, Ploss_LogsQoS0_1PL$rtt, type = "b", main = "RTT QoS0_PL1 (10KByte, 1PproSek)
```

### RTT QoS0\_PL1 (10KByte, 1PproSek)



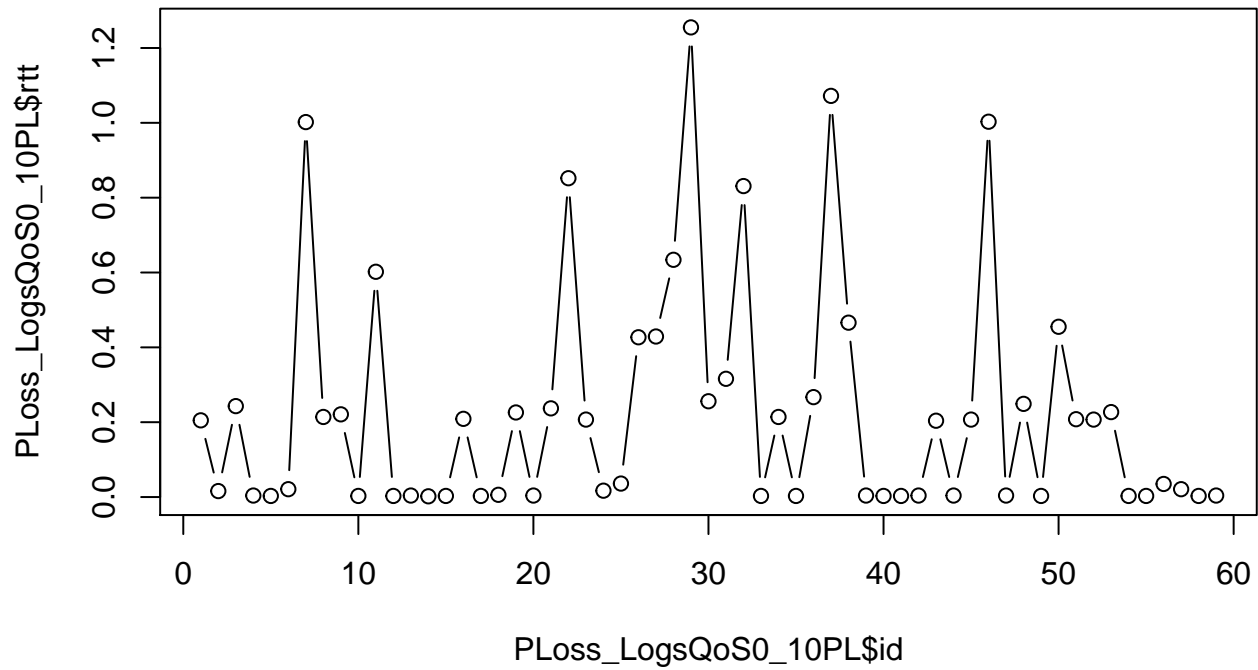
```
plot(PLoss_LogsQoS0_5PL$id, PLoss_LogsQoS0_5PL$rtt, type = "b", main = "RTT QoS0_PL5 (10KByte, 1PproSek)
```

### RTT QoS0\_PL5 (10KByte, 1PproSek)



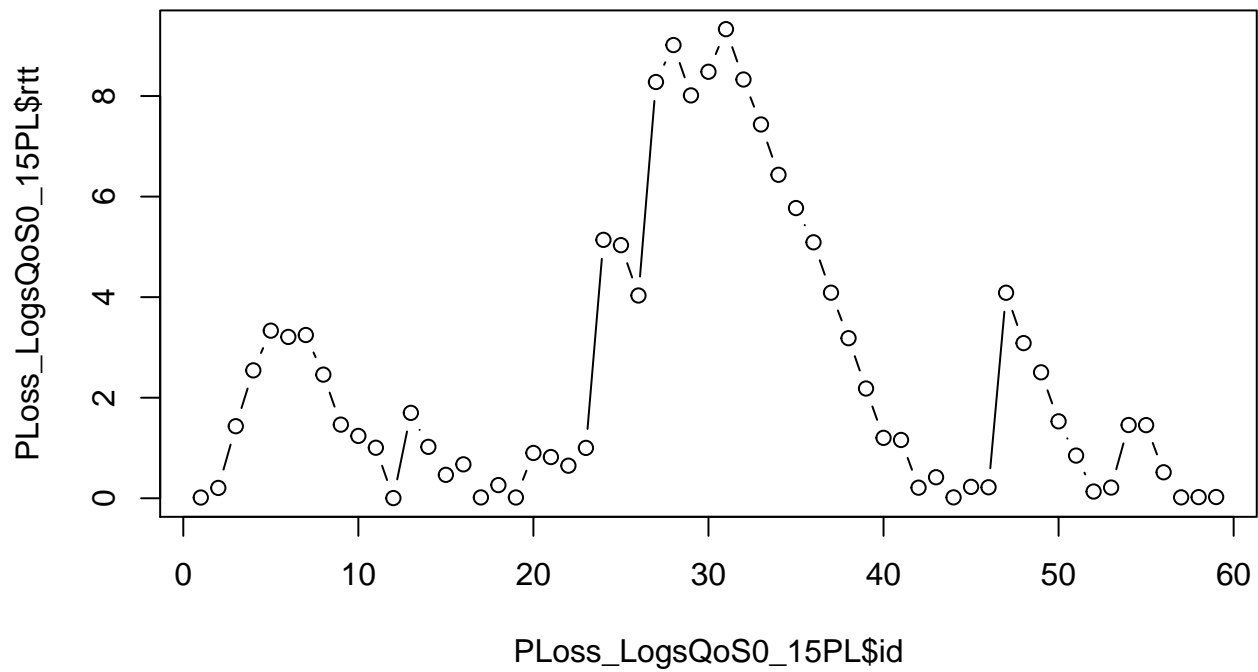
```
plot(PLoss_LogsQoS0_10PL$id, PLoss_LogsQoS0_10PL$rtt, type = "b", main = "RTT QoS0_PL10 (10KByte, 1PproSek)
```

### RTT QoS0\_PL10 (10KByte, 1PproSek)



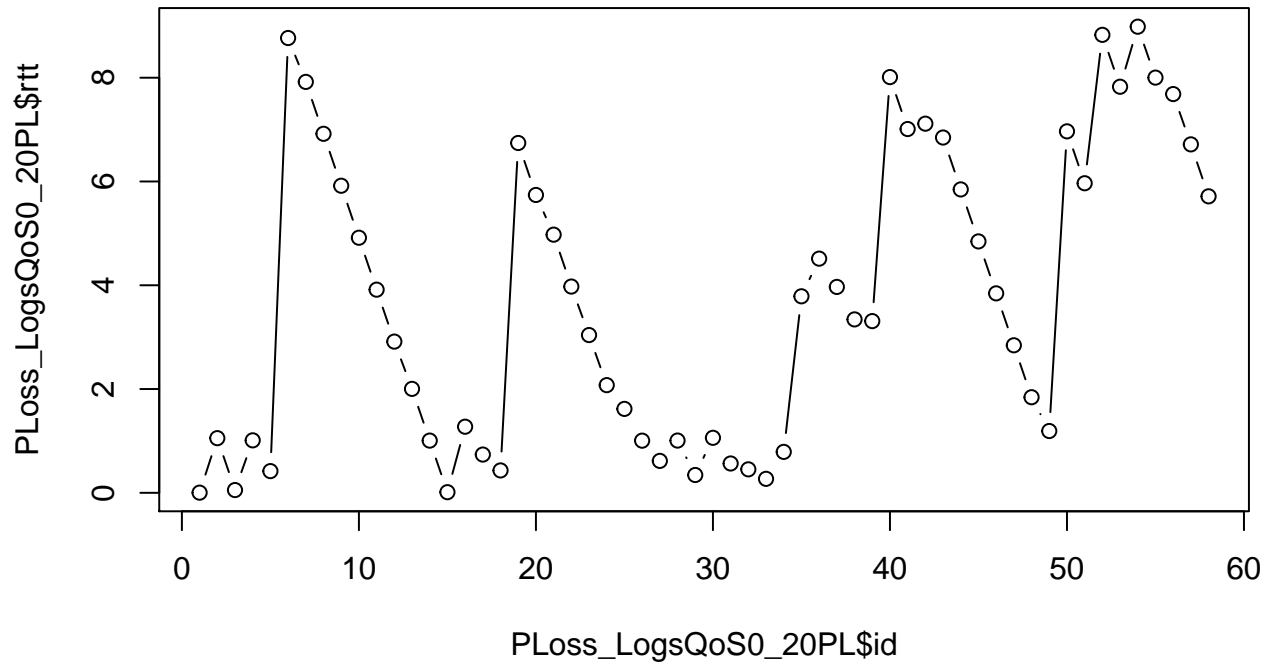
```
plot(PLoss_LogsQoS0_15PL$id, PLoss_LogsQoS0_15PL$rtt, type = "b", main = "RTT QoS0_PL15 (10KByte, 1PproSek)")
```

### RTT QoS0\_PL15 (10KByte, 1PproSek)



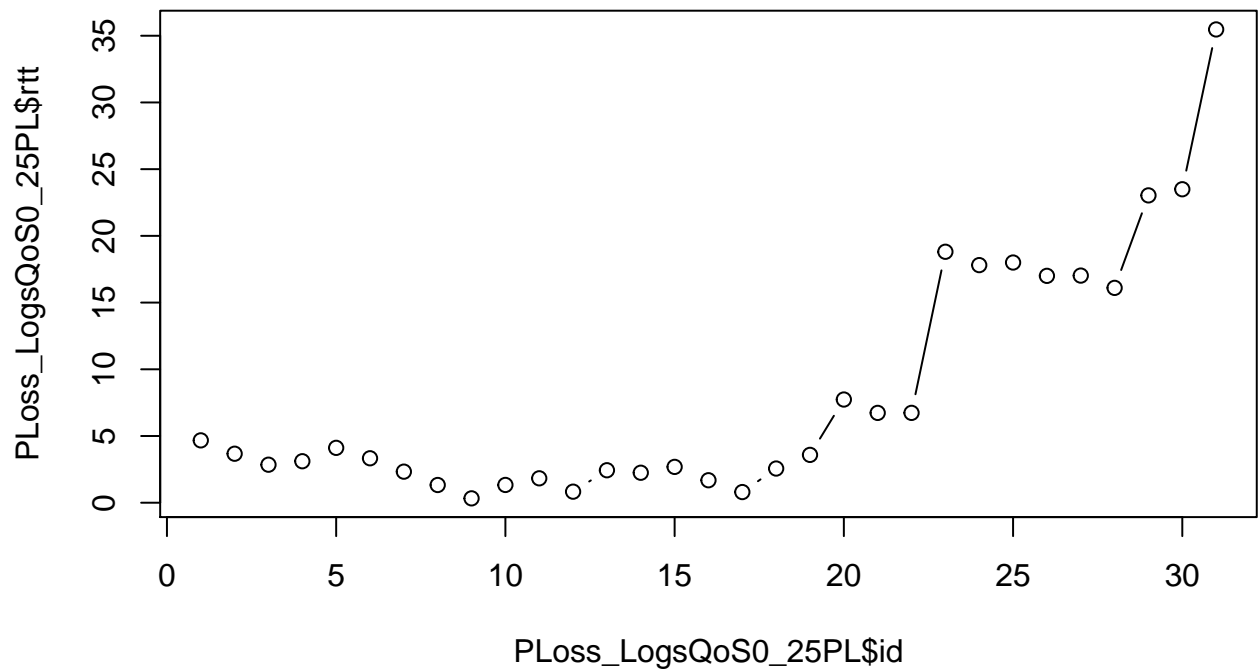
```
plot(PLoss_LogsQoS0_20PL$id, PLoss_LogsQoS0_20PL$rtt, type = "b", main = "RTT QoS0_PL20 (10KByte, 1PproSek)")
```

**RTT QoS0\_PL20 (10KByte, 1PproSek)**



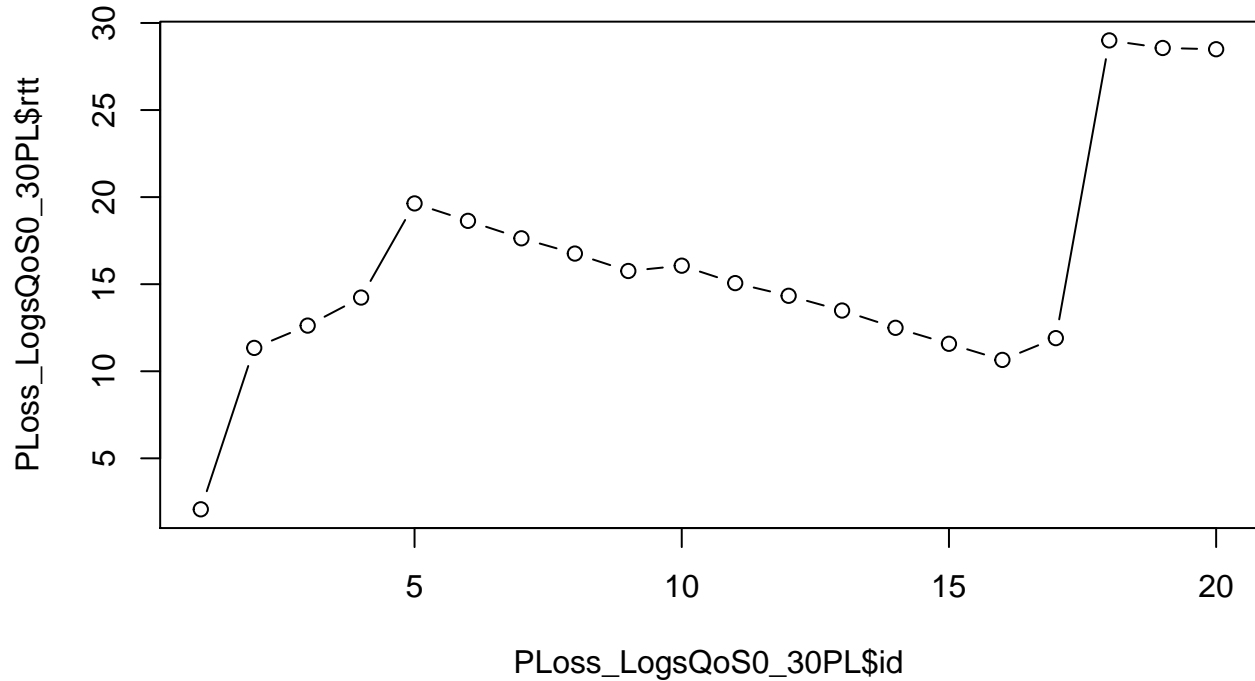
```
plot(PLoss_LogsQoS0_25PL$id, PLoss_LogsQoS0_25PL$rtt, type = "b", main = "RTT QoS0_PL25 (10KByte, 1PproSek)")
```

**RTT QoS0\_PL25 (10KByte, 1PproSek)**



```
plot(PLoss_LogsQoS0_30PL$id, PLoss_LogsQoS0_30PL$rtt, type = "b", main = "RTT QoS0_PL30 (10KByte, 1PproSek)")
```

## RTT QoS0\_PL30 (10KByte, 1PproSek)

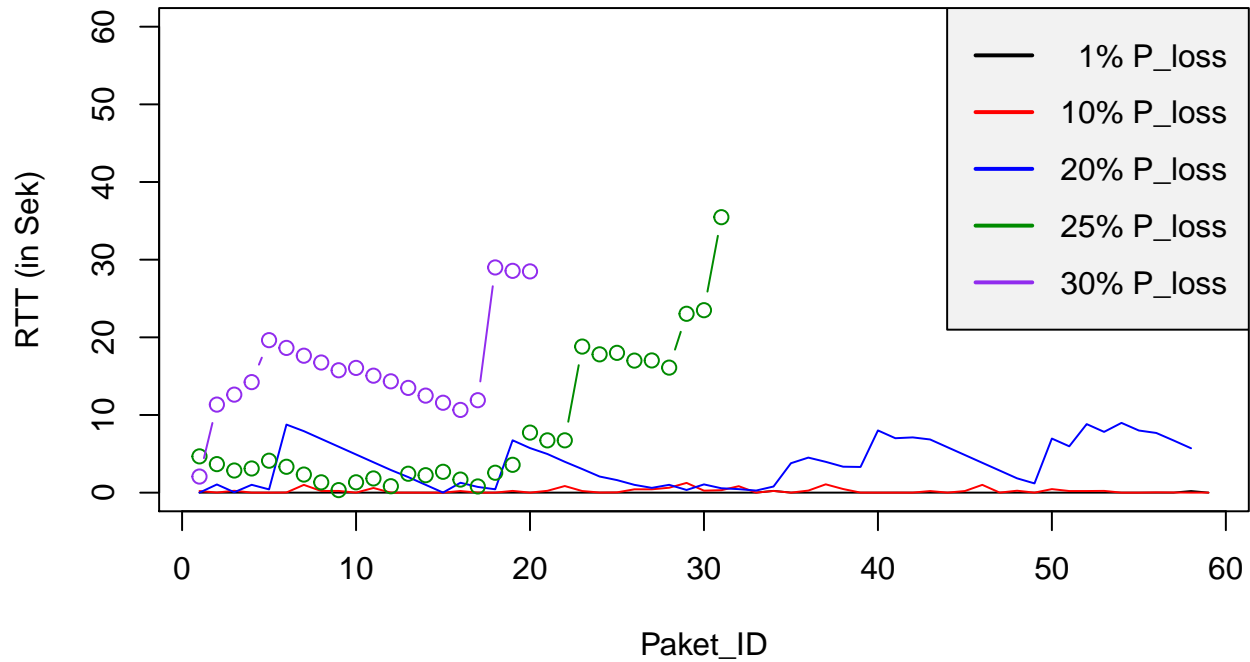


```
plot(PLoss_LogsQoS0_1PL$id, PLoss_LogsQoS0_1PL$rtt, main = "RTT QoS0 (10KByte, 1PproSek)", ylim = c(0, 30),
     ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "l")
points(PLoss_LogsQoS0_10PL$id, PLoss_LogsQoS0_10PL$rtt, col = "red", type = "l")
points(PLoss_LogsQoS0_20PL$id, PLoss_LogsQoS0_20PL$rtt, col = "blue", type = "l")
points(PLoss_LogsQoS0_25PL$id, PLoss_LogsQoS0_25PL$rtt, col = "green4", type = "b")
points(PLoss_LogsQoS0_30PL$id, PLoss_LogsQoS0_30PL$rtt, col = "purple2", type = "b")

legend("topright", c(" 1% P_loss", "10% P_loss", "20% P_loss", "25% P_loss", "30% P_loss"), text.width = 15,
     text.col = "black", cex = 1, lwd = c(2, 2, 2),
     y.intersp = 1.5, merge = FALSE, bg = "gray95")
```



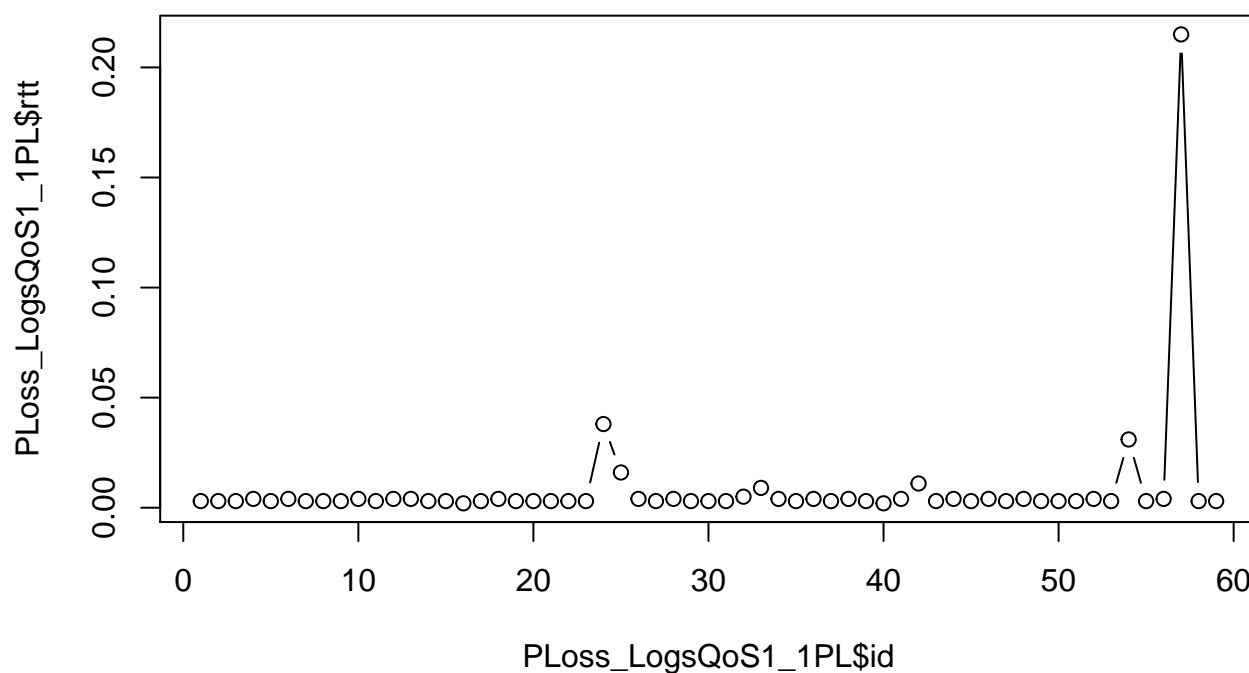
## RTT QoS0 (10KByte, 1PproSek)



```
Ploss_LogsQoS1_1PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 1,]
Ploss_LogsQoS1_5PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 5,]
Ploss_LogsQoS1_10PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 10,]
Ploss_LogsQoS1_15PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 15,]
Ploss_LogsQoS1_20PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 20,]
Ploss_LogsQoS1_25PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 25,]
Ploss_LogsQoS1_30PL<-Ploss_LogsQoS1[Ploss_LogsQoS1$PL_Proz == 30,]

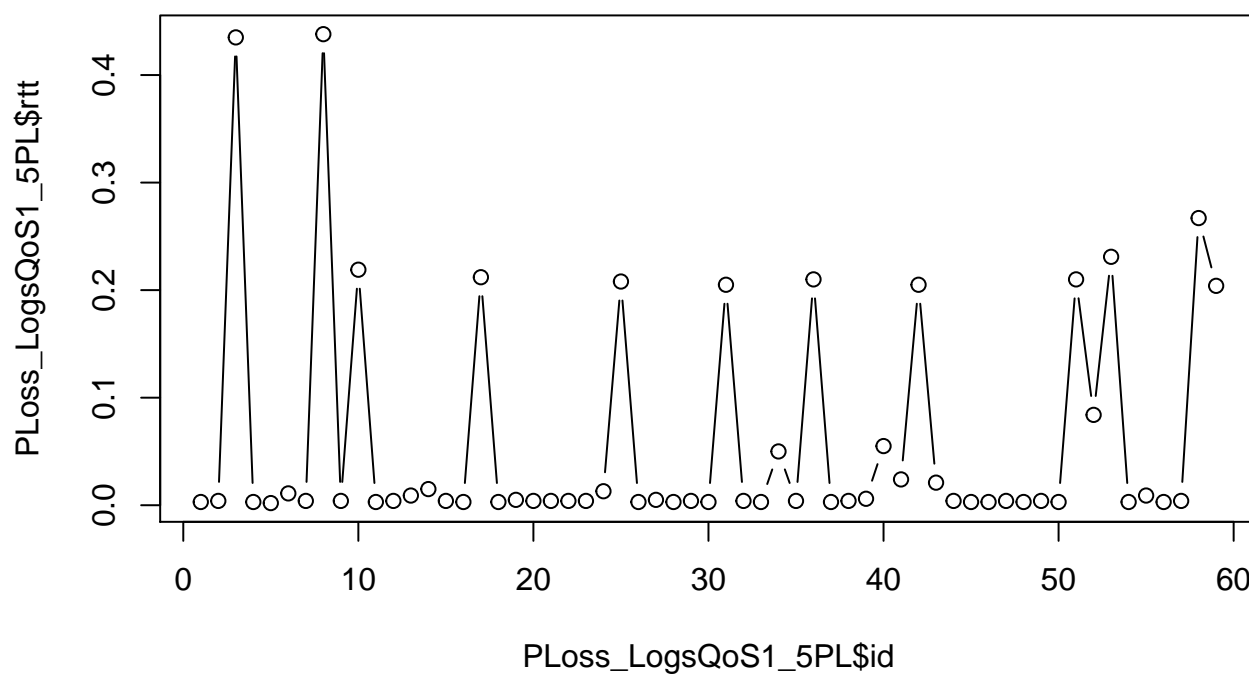
plot(Ploss_LogsQoS1_1PL$id, Ploss_LogsQoS1_1PL$rtt, type = "b", main = "RTT QoS1_PL1 (10KByte, 1PproSek)
```

**RTT QoS1\_PL1 (10KByte, 1PproSek)**



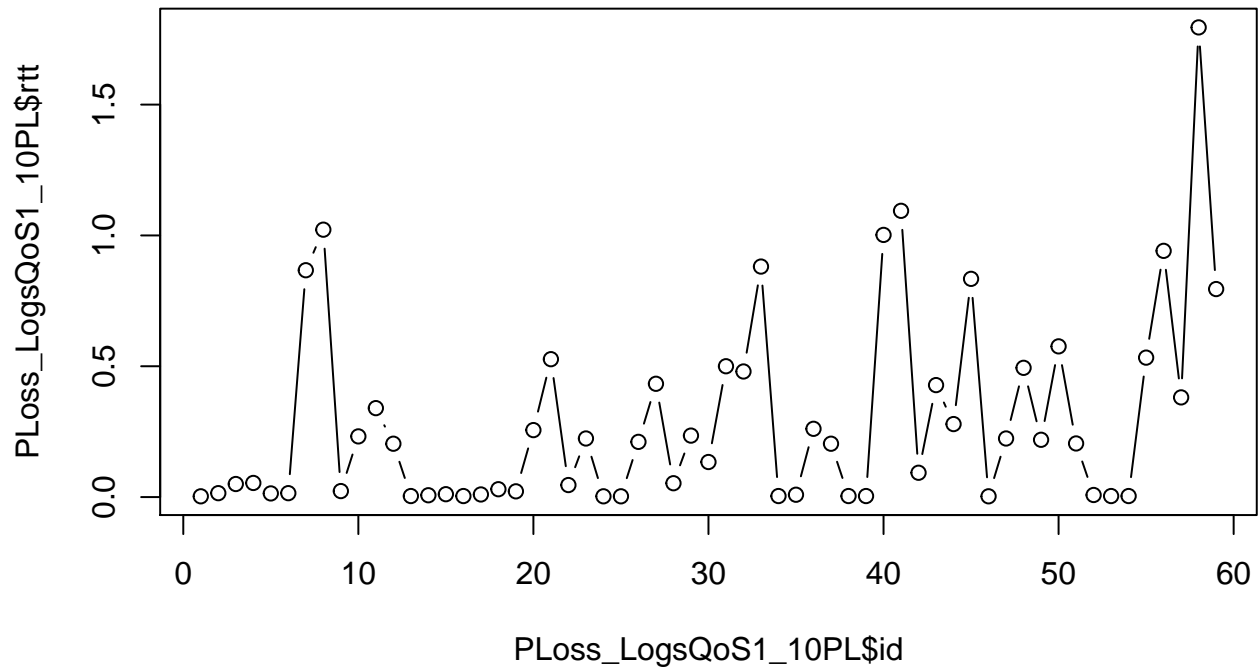
```
plot(PLoss_LogsQoS1_5PL$id, PLoss_LogsQoS1_5PL$rtt, type = "b", main = "RTT QoS1_PL5 (10KByte, 1PproSek)
```

**RTT QoS1\_PL5 (10KByte, 1PproSek)**



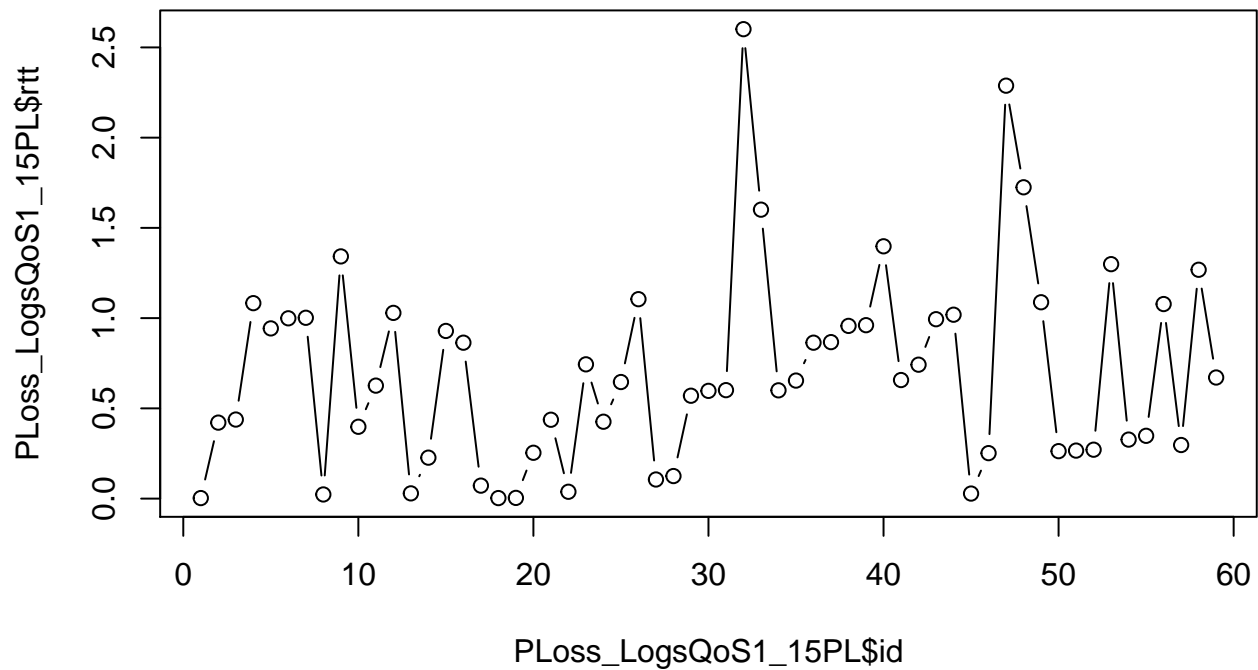
```
plot(PLoss_LogsQoS1_10PL$id, PLoss_LogsQoS1_10PL$rtt, type = "b", main = "RTT QoS1_PL10 (10KByte, 1PproSek)
```

### RTT QoS1\_PL10 (10KByte, 1PproSek)



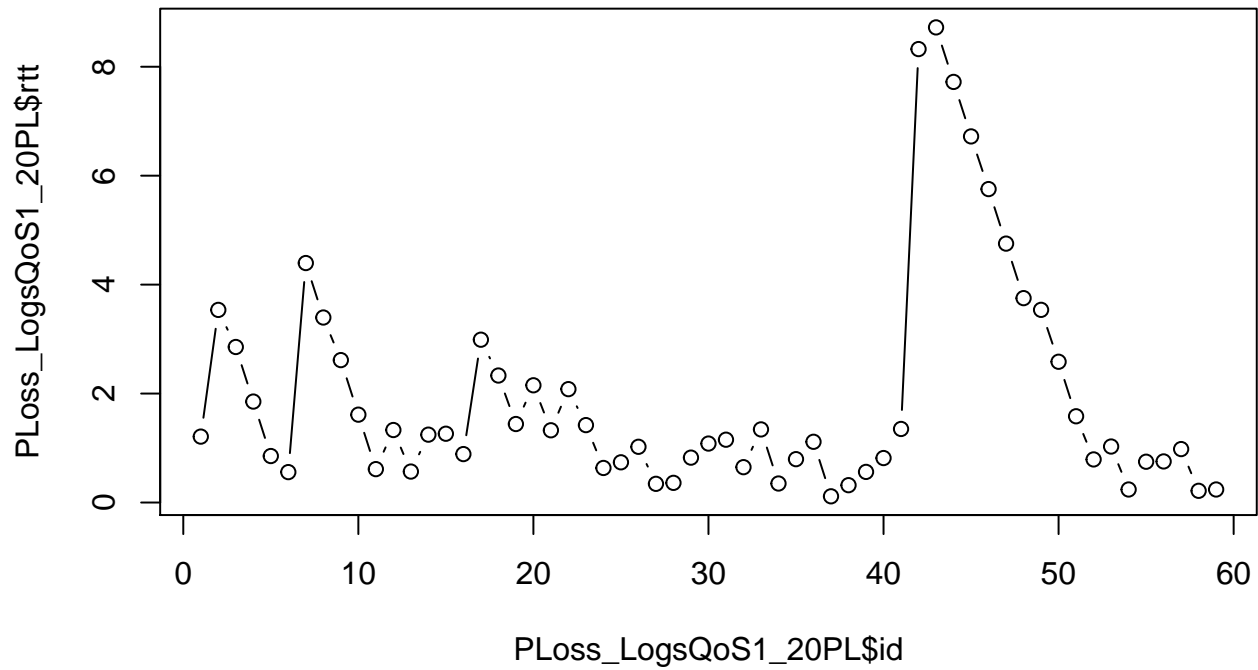
```
plot(PLoss_LogsQoS1_15PL$id, PLoss_LogsQoS1_15PL$rtt, type = "b", main = "RTT QoS1_PL15 (10KByte, 1PproSek)")
```

### RTT QoS1\_PL15 (10KByte, 1PproSek)



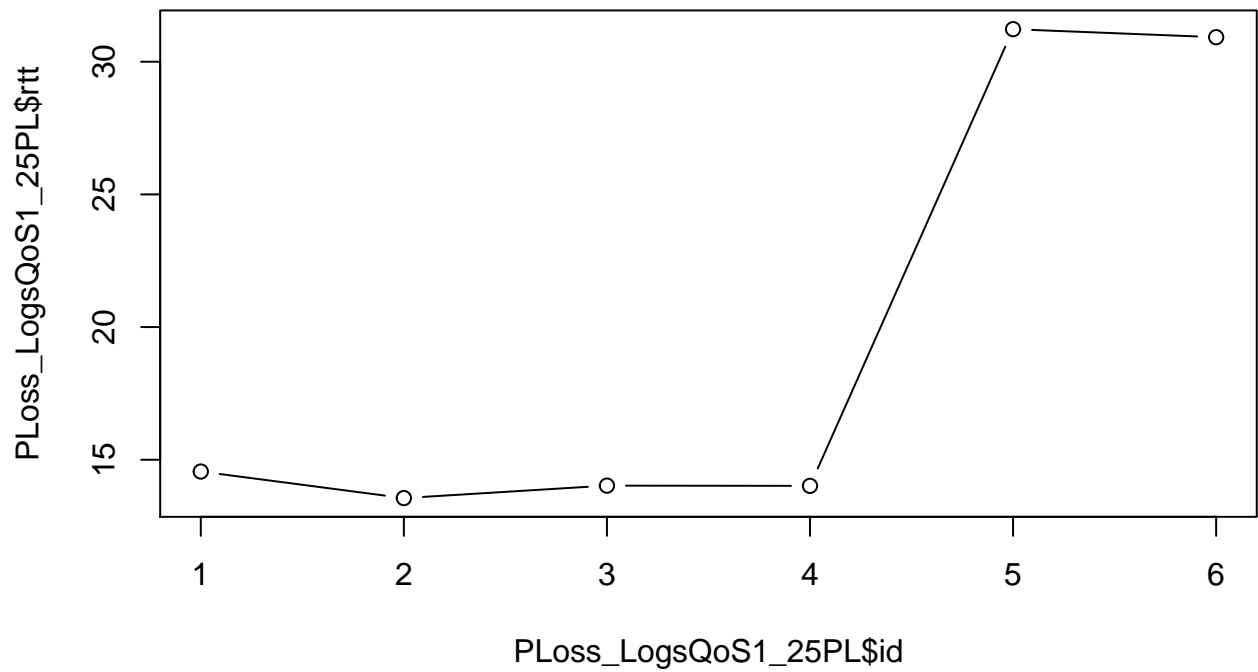
```
plot(PLoss_LogsQoS1_20PL$id, PLoss_LogsQoS1_20PL$rtt, type = "b", main = "RTT QoS1_PL20 (10KByte, 1PproSek)")
```

**RTT QoS1\_PL20 (10KByte, 1PproSek)**



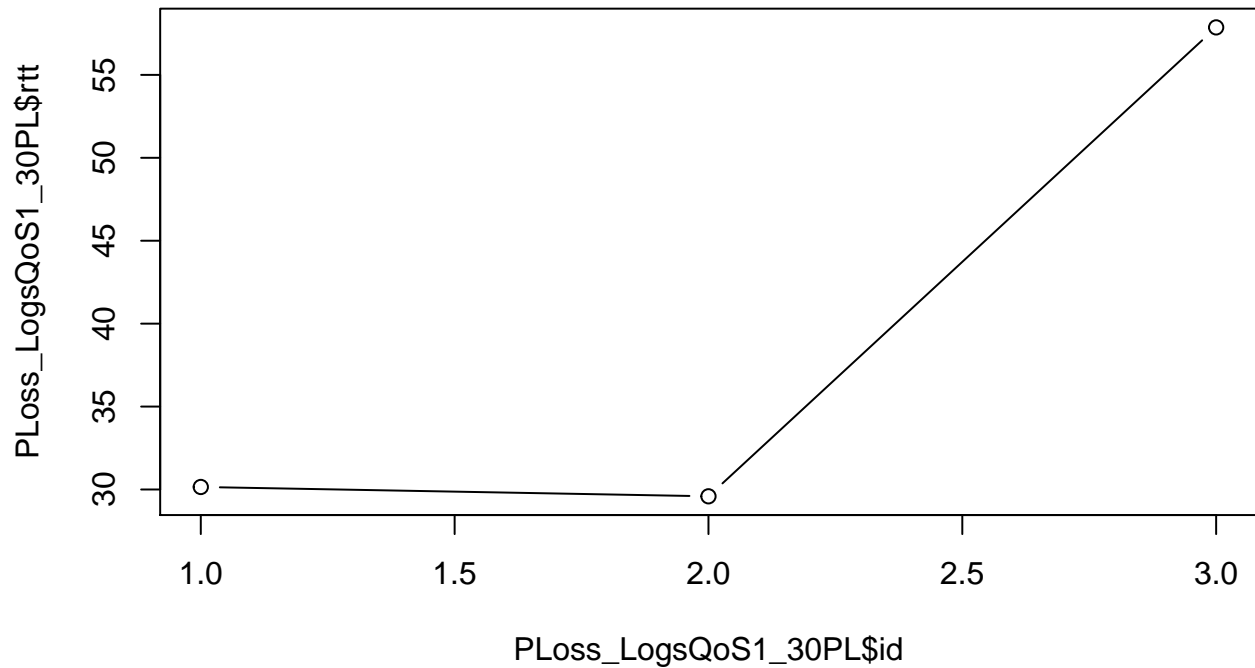
```
plot(PLoss_LogsQoS1_25PL$id, PLoss_LogsQoS1_25PL$rtt, type = "b", main = "RTT QoS1_PL25 (10KByte, 1PproSek)")
```

**RTT QoS1\_PL25 (10KByte, 1PproSek)**



```
plot(PLoss_LogsQoS1_30PL$id, PLoss_LogsQoS1_30PL$rtt, type = "b", main = "RTT QoS1_PL30 (10KByte, 1PproSek)")
```

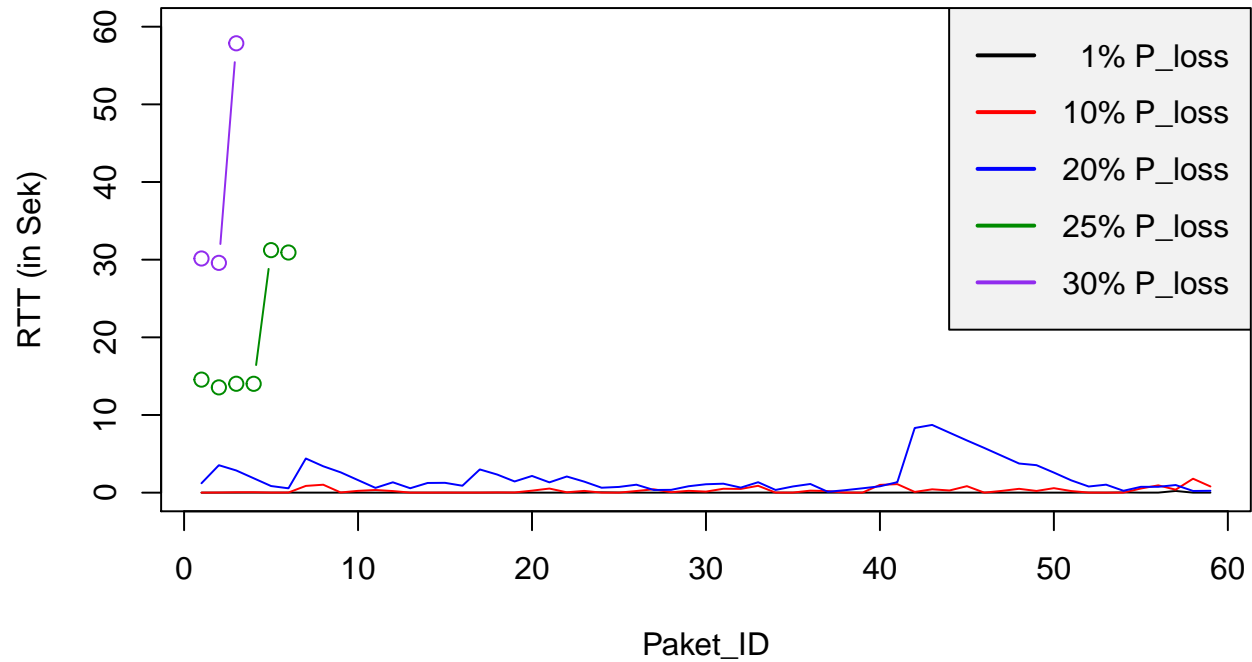
## RTT QoS1\_PL30 (10KByte, 1PproSek)



```
plot(PLoss_LogsQoS1_1PL$id, PLoss_LogsQoS1_1PL$rtt, main = "RTT QoS1 (10KByte, 1PproSek)",
     ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "l", ylim = c(0, 60))
points(PLoss_LogsQoS1_10PL$id, PLoss_LogsQoS1_10PL$rtt, col = "red", type = "l")
points(PLoss_LogsQoS1_20PL$id, PLoss_LogsQoS1_20PL$rtt, col = "blue", type = "l")
points(PLoss_LogsQoS1_25PL$id, PLoss_LogsQoS1_25PL$rtt, col = "green4", type = "b")
points(PLoss_LogsQoS1_30PL$id, PLoss_LogsQoS1_30PL$rtt, col = "purple2", type = "b")

legend("topright", c(" 1% P_loss", "10% P_loss", "20% P_loss", "25% P_loss", "30% P_loss"), text.width
      text.col = "black", cex = 1 ,lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

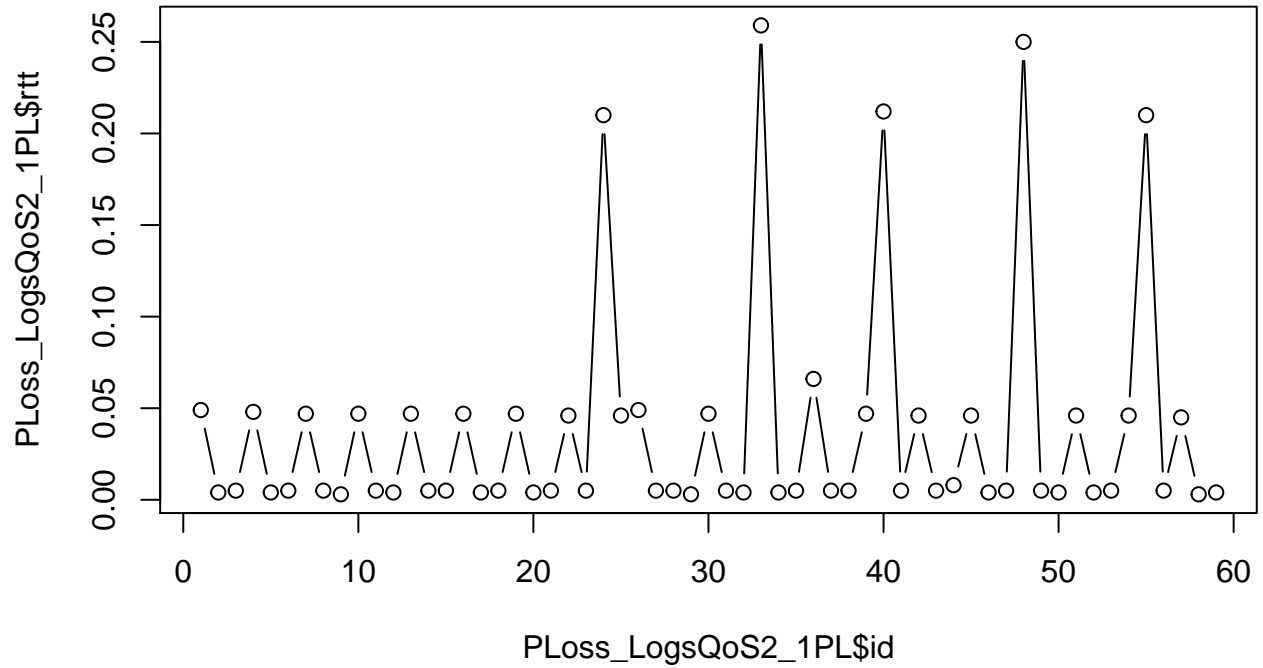
## RTT QoS1 (10KByte, 1PproSek)



```
Ploss_LogsQoS2_1PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 1,]
Ploss_LogsQoS2_5PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 5,]
Ploss_LogsQoS2_10PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 10,]
Ploss_LogsQoS2_15PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 15,]
Ploss_LogsQoS2_20PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 20,]
Ploss_LogsQoS2_25PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 25,]
Ploss_LogsQoS2_30PL<-Ploss_LogsQoS2[Ploss_LogsQoS2$PL_Proz == 30,]

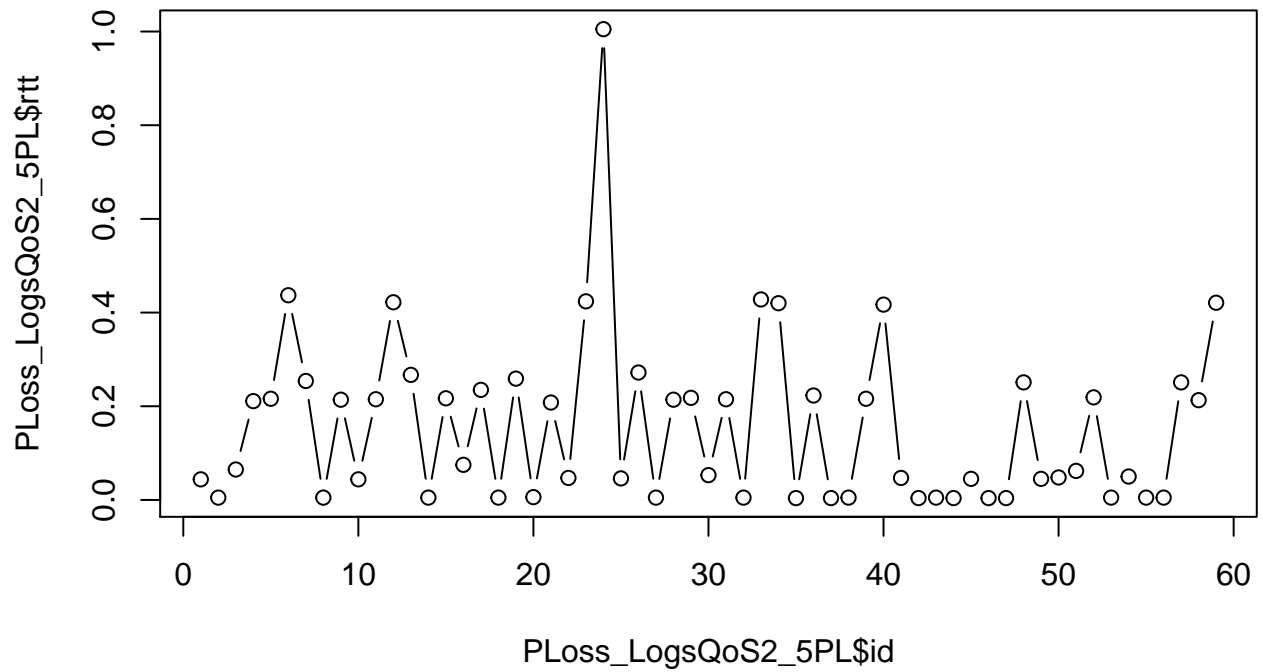
plot(Ploss_LogsQoS2_1PL$id, Ploss_LogsQoS2_1PL$rtt, type = "b", main = "RTT QoS2_PL1 (10KByte, 1PproSek)
```

### RTT QoS2\_PL1 (10KByte, 1PproSek)



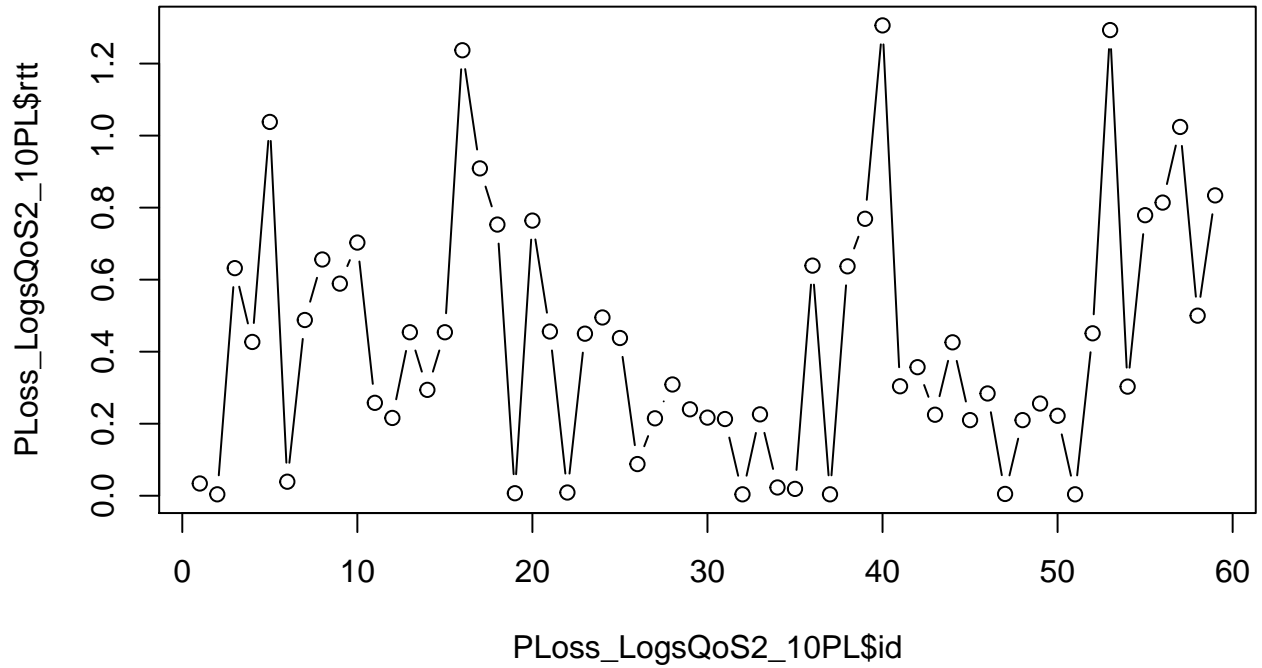
```
plot(PLoss_LogsQoS2_5PL$id, PLoss_LogsQoS2_5PL$rtt, type = "b", main = "RTT QoS2_PL5 (10KByte, 1PproSek)
```

### RTT QoS2\_PL5 (10KByte, 1PproSek)



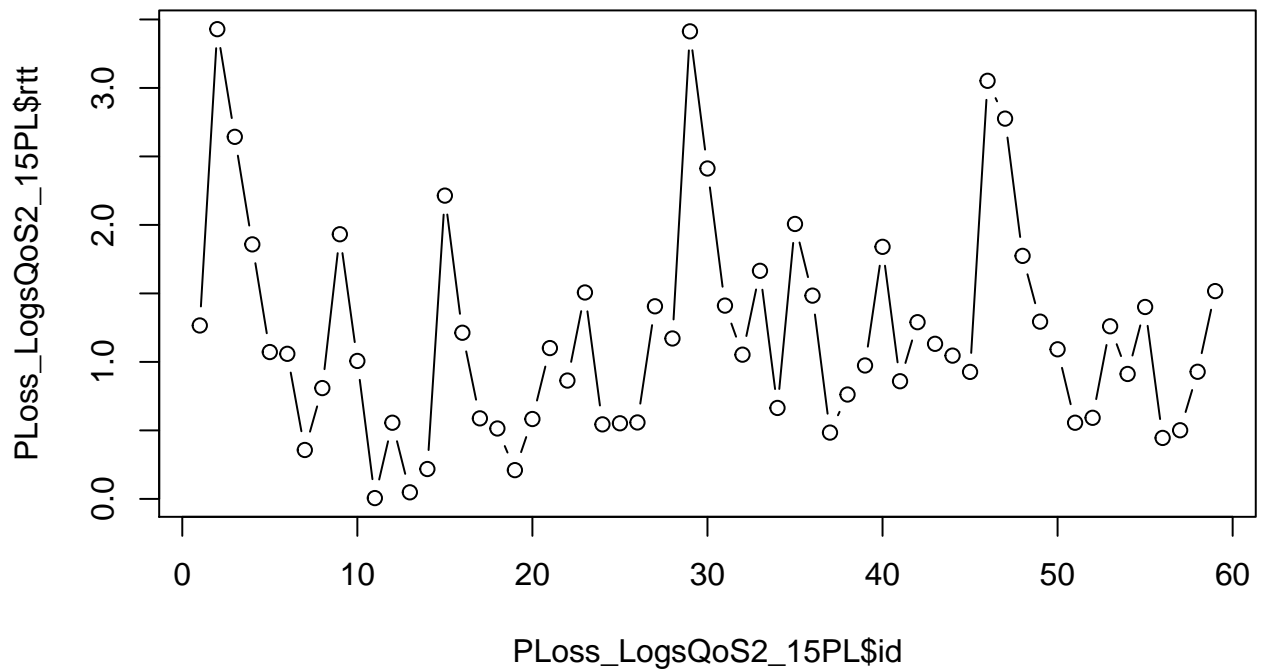
```
plot(PLoss_LogsQoS2_10PL$id, PLoss_LogsQoS2_10PL$rtt, type = "b", main = "RTT QoS2_PL10 (10KByte, 1PproSek)
```

### RTT QoS2\_PL10 (10KByte, 1PproSek)



```
plot(PLoss_LogsQoS2_15PL$id, PLoss_LogsQoS2_15PL$rtt, type = "b", main = "RTT QoS2_PL15 (10KByte, 1PproSek)")
```

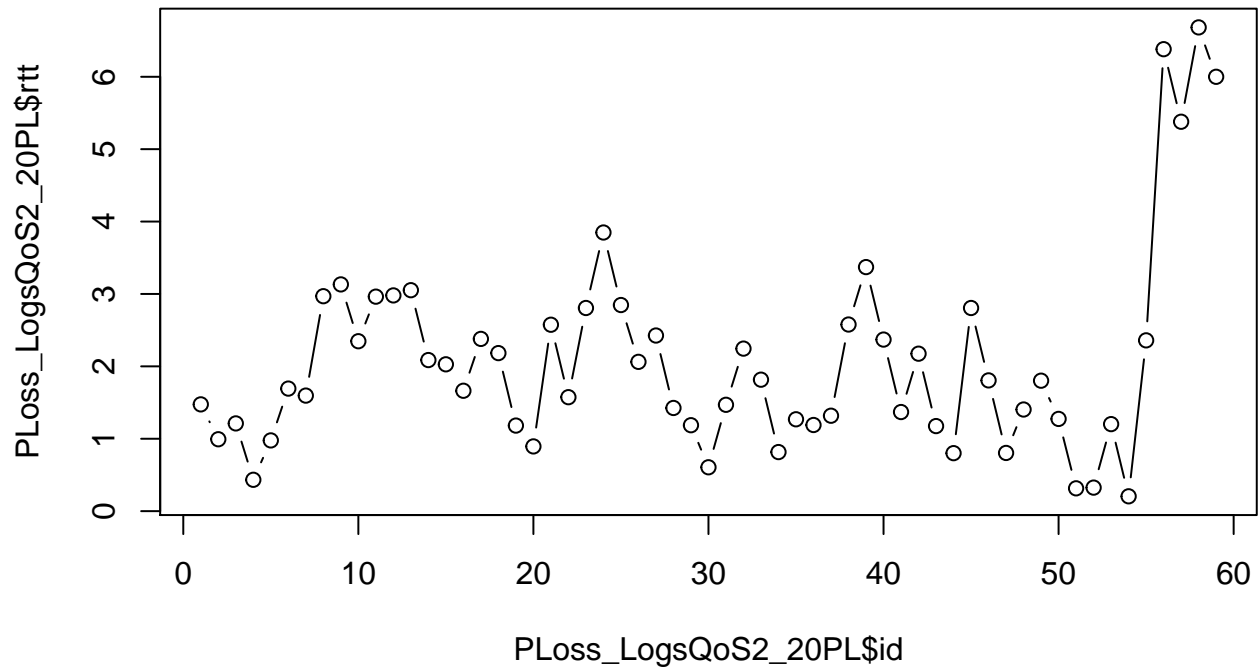
### RTT QoS2\_PL15 (10KByte, 1PproSek)



```
plot(PLoss_LogsQoS2_20PL$id, PLoss_LogsQoS2_20PL$rtt, type = "b", main = "RTT QoS2_PL20 (10KByte, 1PproSek)")
```

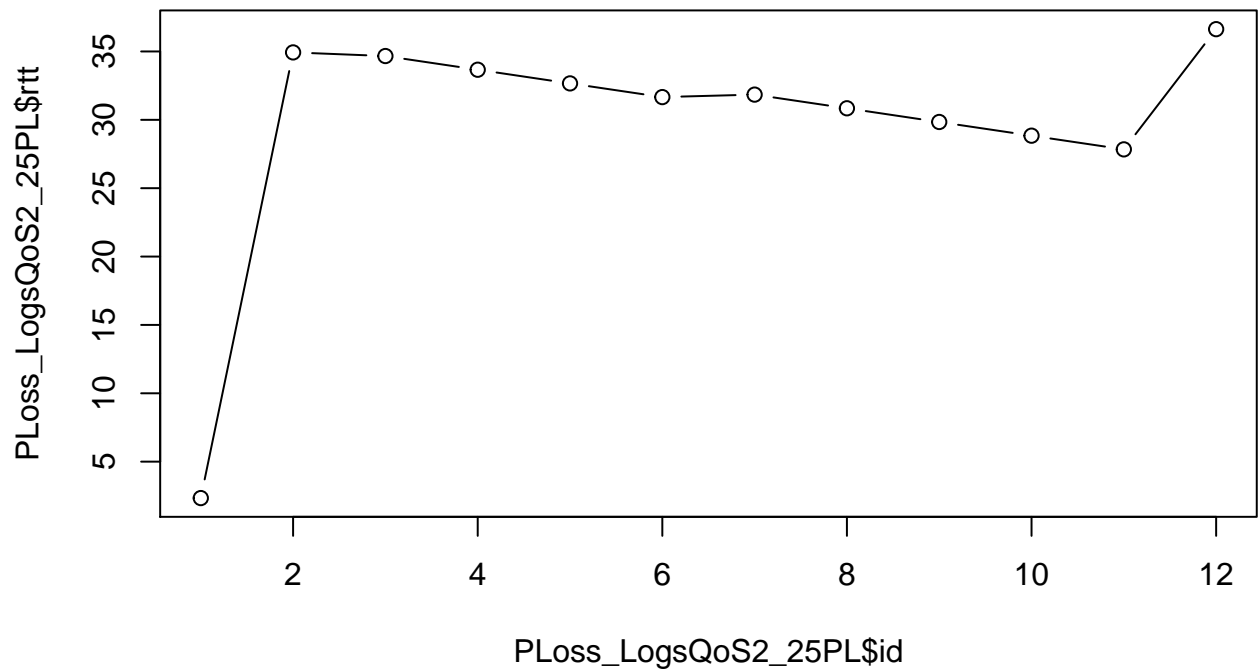


**RTT QoS2\_PL20 (10KByte, 1PproSek)**



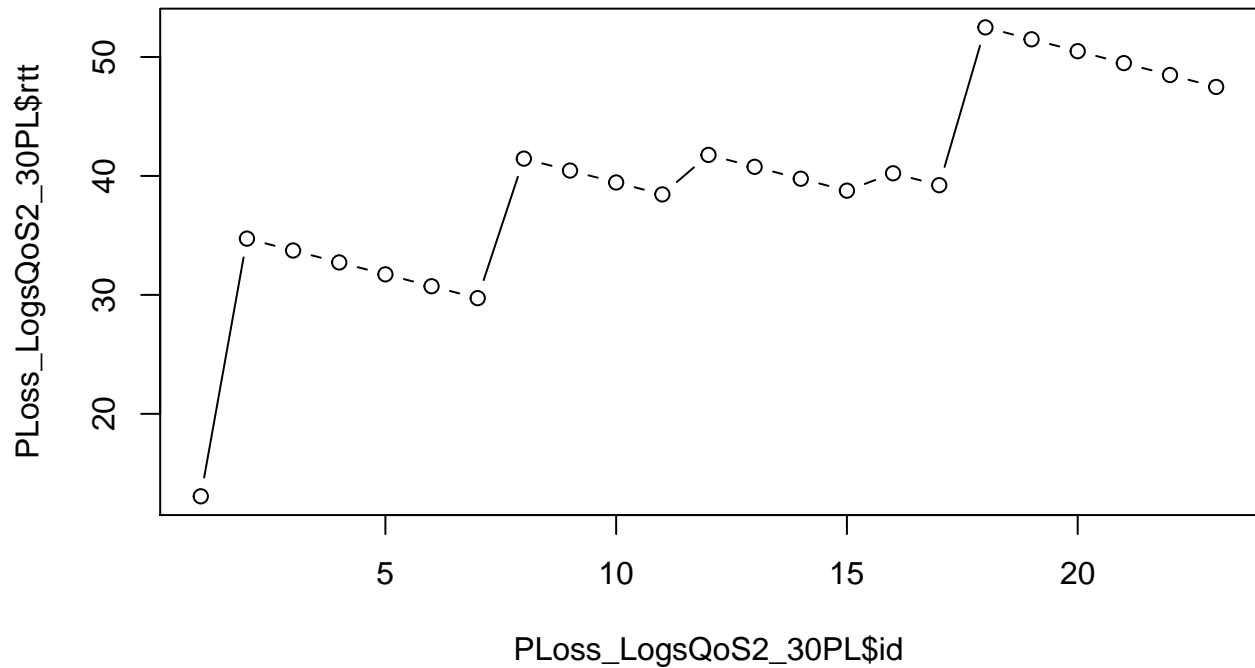
```
plot(PLoss_LogsQoS2_25PL$id, PLoss_LogsQoS2_25PL$rtt, type = "b", main = "RTT QoS2_PL25 (10KByte, 1PproSek)")
```

**RTT QoS2\_PL25 (10KByte, 1PproSek)**



```
plot(PLoss_LogsQoS2_30PL$id, PLoss_LogsQoS2_30PL$rtt, type = "b", main = "RTT QoS2_PL30 (10KByte, 1PproSek)")
```

## RTT QoS2\_PL30 (10KByte, 1PproSek)



```
plot(PLoss_LogsQoS2_1PL$id, PLoss_LogsQoS2_1PL$rtt, main = "RTT QoS2 (10KByte, 1PproSek)", ylim = c(0, 50),
     ylab = "RTT (in Sek)", xlab = "Paket_ID", type = "l")
points(PLoss_LogsQoS2_10PL$id, PLoss_LogsQoS2_10PL$rtt, col = "red", type = "l")
points(PLoss_LogsQoS2_20PL$id, PLoss_LogsQoS2_20PL$rtt, col = "blue", type = "l")
points(PLoss_LogsQoS2_25PL$id, PLoss_LogsQoS2_25PL$rtt, col = "green4", type = "b")
points(PLoss_LogsQoS2_30PL$id, PLoss_LogsQoS2_30PL$rtt, col = "purple2", type = "b")

legend("topright", c(" 1% P_loss", "10% P_loss", "20% P_loss", "25% P_loss", "30% P_loss"), text.width = 15,
      text.col = "black", cex = 1, lwd = c(2, 2, 2),
      y.intersp = 1.5, merge = FALSE, bg = "gray95")
```

### RTT QoS2 (10KByte, 1PproSek)

