ntp_monlist

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```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

## Loading required package: viridisLite

##
## Attaching package: 'lubridate'

## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
```

R Markdown

NT1. NTP: incidência de monlist

Resultados esperados: Historicamente os ataques DRDoS com NTP fazem uso do comando monlist. Analisar a porcentagem de monlist por período, para ver se ela se mantém consistentemente acima de 99% ou houve alteração

Resultados esperados:

- tabela/gráfico de barras com a %monlist por período

```
db <- dbConnect(RSQLite::SQLite(), dbname="../db/database-2022-05-11/dnstor_statistics_ntp.sqlite")

data_unfetch <-dbSendQuery(db, "
  SELECT *, CAST(CAST(year AS text) || CAST(period AS text) as integer) as year_period
    FROM NTP_ANALYSIS
")
data <- fetch(data_unfetch)

data_npt_payload_types_unfetch <-dbSendQuery(db, "
  SELECT id, quantity, SUBSTR(payload,0,25) AS payload_limit
    FROM NTP_PAYLOAD_TYPES
")
```

```
## Warning: Closing open result set, pending rows
```

```
data_ntp_payload_types <- fetch(data_npt_payload_types_unfetch)
```

```
## Warning in result_fetch(res@ptr, n = n): Column ‘payload_limit‘: mixed type,
## first seen values of type string, coercing other values of type blob
```

```
dbDisconnect(db)
```

```
## Warning in connection_release(conn@ptr): There are 1 result in use. The
## connection will be released when they are closed
```

- Calculado a porcentagem de “ntp_type” por período
  - Existem apenas dois tipos em “ntp_type” = {“Monlist”, “Outros”}
  - Além disso o “ntp_type” é definido da seguinte forma “‘python

def get_ntp_type(ntp_payload):

if len(ntp_payload) <= 3: return “Other”

if (monlist_byte0[0] == ntp_payload[0] and monlist_byte3[0] == ntp_payload[3]): return “Monlist”

return “Other” “‘

- Agrupamento realizado:

```
data['tempo_final_cast'] = as.POSIXct(data[['tempo_final']], format = "%Y-%m-%d %H:%M:%S")
data['tempo_inicio_cast'] = as.POSIXct(data[['tempo_inicio']], format = "%Y-%m-%d %H:%M:%S")

data_grouped_period_ntp_type = data %>%
  mutate(year_period = as.factor(year_period)) %>%
  group_by(year_period, ntp_type) %>%
  summarise(sum_requests_per_attack = sum(requests_per_attack), number_of_attacks = n())
```

```
## ‘summarise()‘ has grouped output by ’year_period’. You can override using the
## ‘.groups‘ argument.
```

```
data_grouped_period_ntp_type_percentage = data_grouped_period_ntp_type %>%
  group_by(year_period) %>%
  summarise(ntp_type = ntp_type, number_of_attacks = number_of_attacks,
            sum_period_number_of_attacks = sum(number_of_attacks),
            sum_period_requests_per_attack = sum(sum_requests_per_attack),
            sum_requests_per_attack = sum_requests_per_attack) %>%
  mutate(number_of_attacks_percentage = (number_of_attacks / sum_period_number_of_attacks) * 100,
         number_of_requests_percentage = (sum_requests_per_attack / sum_period_requests_per_attack) * 10
```

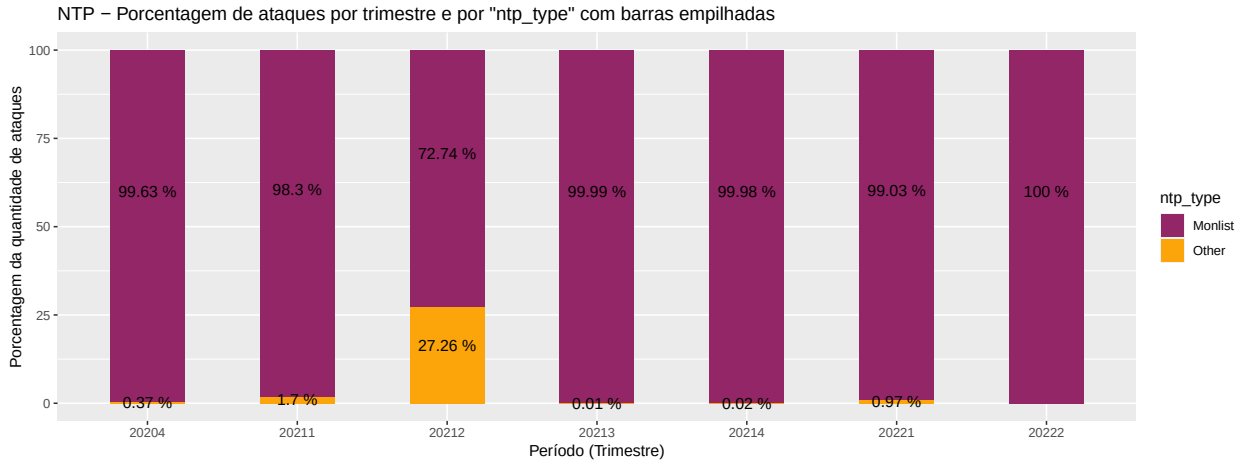
```
## ‘summarise()‘ has grouped output by ’year_period’. You can override using the
## ‘.groups‘ argument.
```

```
data_grouped_period_ntp_type_percentage %>%
  select(year_period, ntp_type, number_of_attacks_percentage, number_of_attacks) %>%
  print(n=14)
```

```
## # A tibble: 13 x 4
## # Groups:   year_period [7]
##    year_period ntp_type number_of_attacks_percentage number_of_attacks
##    <fct>       <chr>                           <dbl>             <int>
##  1 20204       Monlist                        99.6                17988
##  2 20204       Other                           0.371                67
##  3 20211       Monlist                        98.3                 9398
##  4 20211       Other                           1.70                163
##  5 20212       Monlist                        72.7                 483
##  6 20212       Other                          27.3                 181
##  7 20213       Monlist                       100.                51839
##  8 20213       Other                           0.00772              4
##  9 20214       Monlist                       100.                20950
## 10 20214       Other                           0.0191               4
## 11 20221       Monlist                        99.0                 306
## 12 20221       Other                           0.971                3
## 13 20222       Monlist                       100                  112
```

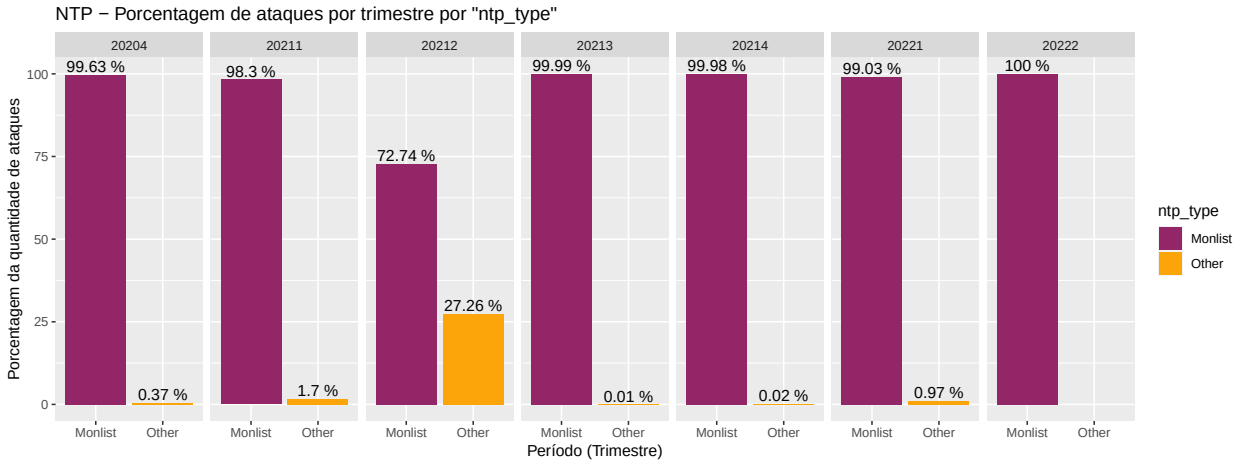
- Isso significa que no ultimo trimestre de 2020 ("year_period" = 20204) 99% dos ataques realizados foram monlist, e 0.3% outros tipos
- Gráfico de barras empilhadas apresentando a porcentagem da quantidade de ataques em cada "ntp_type" por período

```
data_grouped_period_ntp_type_percentage %>%
  ggplot( aes(x=year_period, y=number_of_attacks_percentage, fill=ntp_type)) +
    geom_bar(stat="identity", width = 0.5) +
    geom_text(aes(label = paste(round(number_of_attacks_percentage, 2), "%")),
              position = position_stack(vjust = 0.6)) +
    scale_fill_viridis(discrete=TRUE, option="inferno", begin = 0.8, end = 0.4, direction = -1) +
    ylab("Porcentagem da quantidade de ataques") +
    xlab("Período (Trimestre)") +
    ggtitle("NTP - Porcentagem de ataques por trimestre e por \"ntp_type\" com barras empilhadas")
```



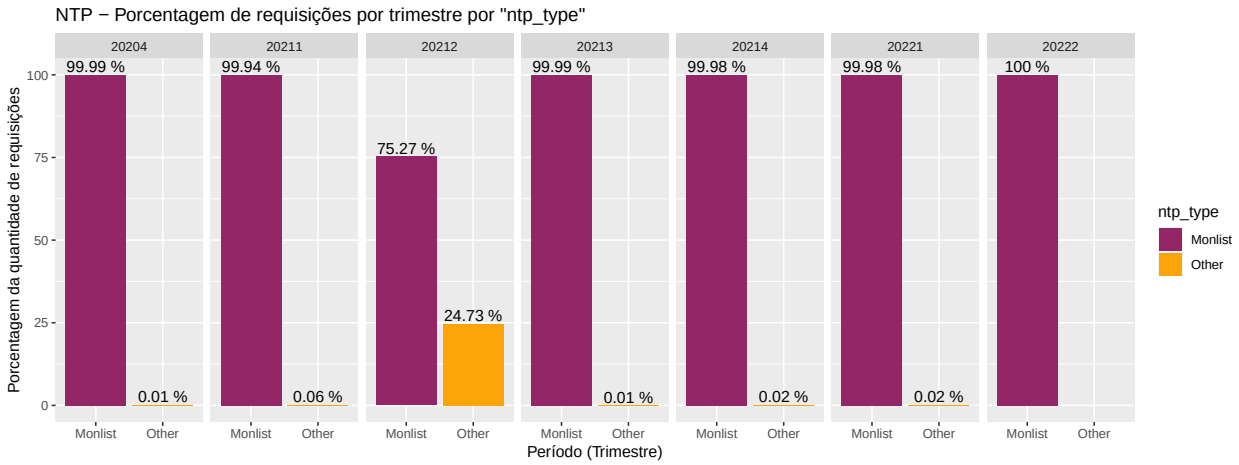
- Gráfico de barras empilhadas apresentando a porcentagem da quantidade de ataques em cada "ntp_type" por período

```
data_grouped_period_ntp_type_percentage %>%
  ggplot( aes(x=ntp_type, y=number_of_attacks_percentage, fill=ntp_type)) +
    #geom_bar(stat="identity", width = 0.5, prosition = "dodge") +
    geom_bar(stat="identity", position="dodge") +
    geom_text(aes(label = paste(round(number_of_attacks_percentage, 2), "%"),  vjust = -0.25)) +
    scale_fill_viridis(discrete=TRUE, option="inferno", begin = 0.8, end = 0.4, direction = -1) +
    facet_grid(~year_period) +
    ylab("Porcentagem da quantidade de ataques") +
    xlab("Período (Trimestre)") +
    ggtitle("NTP - Porcentagem de ataques por trimestre por \"ntp_type\"")
```



- Gráfico de barras empilhadas apresentando a porcentagem da quantidade de requisições em cada "ntp_type" por período

```
data_grouped_period_ntp_type_percentage %>%
  ggplot( aes(x=ntp_type, y=number_of_requests_percentage, fill=ntp_type)) +
    #geom_bar(stat="identity", width = 0.5, prosition = "dodge") +
    geom_bar(stat="identity", position="dodge") +
    geom_text(aes(label = paste(round(number_of_requests_percentage, 2), "%"),  vjust = -0.25)) +
    scale_fill_viridis(discrete=TRUE, option="inferno", begin = 0.8, end = 0.4, direction = -1) +
    facet_grid(~year_period) +
    ylab("Porcentagem da quantidade de requisições") +
    xlab("Período (Trimestre)") +
    ggtitle("NTP - Porcentagem de requisições por trimestre por \"ntp_type\"")
```




```
ntp_payload_types = data_ntp_payload_types %>%
  mutate(payload_str = toString(payload_limit)) %>%
  arrange(desc(quantity)) %>%
  select('quantity', 'payload_limit', 'id')

ntp_payload_types_quantity_percentage = ntp_payload_types %>%
  mutate(sum_quantity = sum(quantity)) %>%
  mutate(quantity_percentage = (quantity / sum_quantity) * 100)

ntp_payload_types_quantity_percentage %>%
  #filter(quantity_percentage > 0.10) %>%
  select('quantity_percentage', 'payload_limit') %>%
  print(15)
```

```
##    quantity_percentage                                payload_limit
## 1           99.5842283                                      Monlist
## 2            0.3940964                                        0\x84
## 3            0.0098524                                         \xe3
## 4            0.0019705                                         \027
## 5            0.0019705                                            >
## 6            0.0009852                D.H\023~Hu>$ Q>)E\rOhq\005-;nr}
## 7            0.0009852
## 8            0.0009852 ‘.tah\033\030\023C\001N\001\b@\036#!4INdd\b‘
## 9            0.0009852  8.\006VMh\005\020:\0069\r2\022y_MQK}s\035o;
## 10           0.0009852                                      1700032A
## 11           0.0009852                                      \026\002
## 12           0.0009852
## 13           0.0009852                                             S
```

```
#ntp_payload_types_quantity_percentage %>%
#  select('quantity_percentage', 'payload_limit') %>%
#  ggplot( aes(x=payload_limit, y=quantity_percentage)) +
#  geom_bar(stat="identity", position="dodge")
```