

Produce a technical and business plan for an "Irish" TRR

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Abstract—abstract
Index Terms—TRR

I. INTRODUCTION

II. THE POLICY IN IRELAND

III. THE DNS TRAFFIC IN IRELAND

The DNS traffic is an important consideration for building a DNS server. Irish TRR servers have to be capable to deal with the DNS traffic of national scale traffic in Ireland.

There are some methods to estimate the Irish DNS traffic.

In a report from Central Statistics Office of Ireland, it showed that there were 89% of Irish households have the internet at home in 2018 [1]. From the growth of households with the internet, the percentage is probably 90% in 2020. There were about 4.57 billion internet users in the world in July 2020 [2]. The population in Ireland was around 4.944 million in August 2020 [3]. Hence, the Irish Internet users may be about 4.113 million, it was approximately 0.09% of internet users in the whole world.

According to the data from Akamai.com [4], the overall DNS traffic in the world was about 7 Trillion transactions (Requests and responses) in June 2020. Then, 0.09% of DNS traffic in the world could be Irish DNS traffic, which is around 6.3 billion DNS transactions for one month in Ireland. On average, it could be 210 DNS million transactions in a day in Ireland.

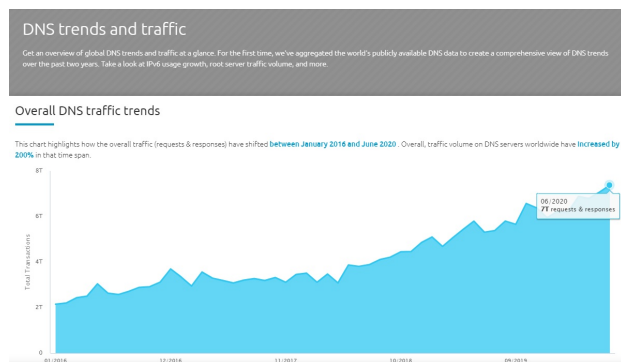


Fig. 1. The trend of DNS traffic in the world [4]

Month	IPv4	IPv6	Total
06/2020	6T	1T	7T
01/2020	5T	969B	6T
07/2019	4T	919B	5T
01/2019	4T	848B	5T
07/2018	3T	564B	4T
01/2018	3T	426B	4T
07/2017	3T	371B	3T
01/2017	3T	363B	3T
07/2016	2T	248B	3T
01/2016	2T	171B	2T

TABLE I

OVERALL DNS TRAFFIC TRENDS(UNIT:TRANSACTIONS) [4]

However, internet traffic is changeable in different hours, it is necessary to understand when are the rush hours. For example, the internet rush hours are usually between 7 pm and 11 pm in UK [5]. In Sao Paulo, the internet rush hours are between 8 pm and 11 pm [6]. In USA, it is 8 pm to 10 pm [7]. In Berlin, the rush hours are 8 pm to 11 pm [8]. In Amsterdam, it is from 8 pm to 11 pm as well [9].

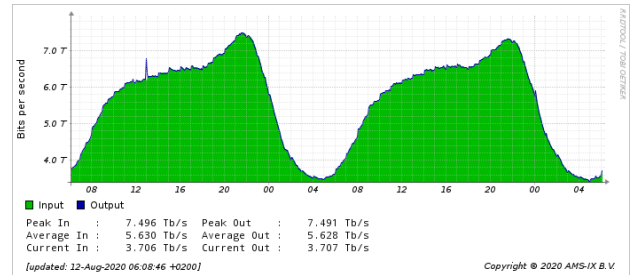


Fig. 2. The internet traffic in a day (Amsterdam) [9]

All the reports in different countries or cities revealed that internet rush hours are from 8 pm to 11 pm, the distributions are pretty similar. Therefore, Irish internet rush hours could be assumed as from 8 pm to 11 pm as well.

As for the comparison in different days in a week, from Monday to Sunday, the change is not obvious. About the days in a month, from the begin to the end of a month, there is no huge difference as well.

Taking the data in Amsterdam to estimate the percentage of usage in each hour, the result is shown in TABLE II.

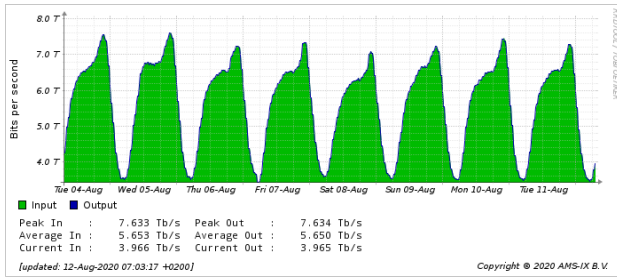


Fig. 3. The internet traffic in a week (Amsterdam) [9]

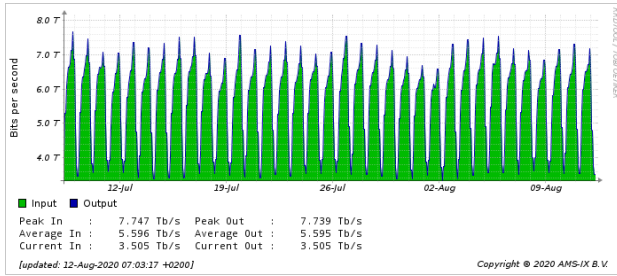


Fig. 4. The internet traffic in a month (Amsterdam) [9]

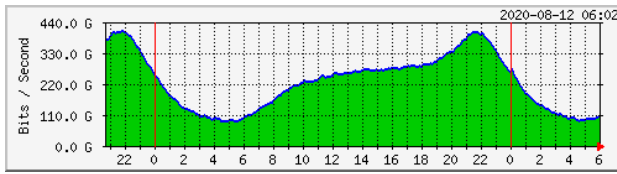


Fig. 5. The internet traffic in a day (Berlin) [9]

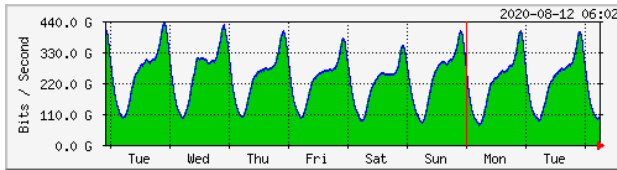


Fig. 6. The internet traffic in a week (Berlin) [9]

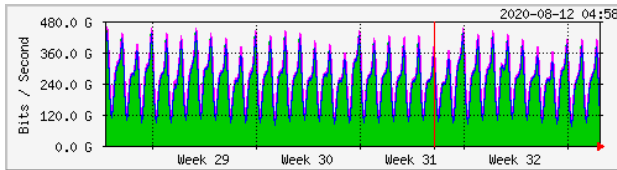


Fig. 7. The internet traffic in a month (Berlin) [9]

After that, using the percentage to multiply the estimated number of daily DNS transactions in Ireland, which is 210 million, then the result is shown in TABLE III. The 2 busiest hours are 9 PM and 10 PM, the number of DNS transactions could be 11.2 million in an hour.

A DNS transaction contains many packets.

Hour(24)	Trillion bit/s	Percentage
0	5.8	4.3%
1	4.8	3.56%
2	4	2.96%
3	3.7	2.74%
4	3.6	2.67%
5	3.5	2.59%
6	3.6	2.67%
7	4	2.96%
8	4.8	3.56%
9	5.4	4%
10	5.8	4.3%
11	6	4.44%
12	6.2	4.59%
13	6.4	4.74%
14	6.4	4.74%
15	6.6	4.89%
16	6.6	4.89%
17	6.6	4.89%
18	6.5	4.81%
19	6.7	4.96%
20	6.9	5.11%
21	7.2	5.33%
22	7.2	5.33%
23	6.7	4.96%
Total	135	100%

TABLE II

INTERNET TRAFFIC AND ITS PERCENTAGE IN EACH HOUR IN A DAY IN AMSTERDAM [9]

Hour(24)	Percentage	Million transactions
0	4.3%	9.02
1	3.56%	7.47
2	2.96%	6.22
3	2.74%	5.76
4	2.67%	5.6
5	2.59%	5.44
6	2.67%	5.6
7	2.96%	6.22
8	3.56%	7.47
9	4%	8.4
10	4.3%	9.02
11	4.44%	9.33
12	4.59%	9.64
13	4.74%	9.96
14	4.74%	9.96
15	4.89%	10.27
16	4.89%	10.27
17	4.89%	10.27
18	4.81%	10.11
19	4.96%	10.42
20	5.11%	10.73
21	5.33%	11.2
22	5.33%	11.2
23	4.96%	10.42
Total	100%	210

TABLE III

USING THE DAILY DISTRIBUTION OF INTERNET TRAFFIC OF AMSTERDAM TO ESTIMATE THE DNS TRAFFIC IN IRELAND [9]

IV. THE CONCERN OF DDOS ATTACKS

V. THE CONCERN OF OTHER ISSUES

VI. CONCLUSION

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