Domain Abuse Activity Reporting (DAAR) System

Report on data from 31 January 2018

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Contents

Executive Summary

This 31 January 2018 report from the Domain Abuse Activity Reporting (DAAR) system considers 185,025,982 resolving domain names from 1221 generic Top-Level Domains (gTLDs). The reputation feeds the DAAR system employs reported at least one security threat in 390 of the 1221 gTLDs as of 31 January 2018. As a result, this report provides an analysis for only the 184,410,170 domains within the 390 gTLDs with at least one security threat.

Approximately 89 percent of the resolving domain names were in gTLDs launched before 2010 (referred to hereafter as "Legacy gTLDs"). Of the 1,675,964 domains identified as security threats, 875,010 or 52.21 percent were in legacy gTLDs. The other 800,954 or 47.79 percent were in the new gTLDs.

Domains identified as security threats are not uniformly distributed across the gTLDs analyzed in this report. In the case of new gTLDs, 93 percent of the domains identified as security threats were in just 18 of those gTLDs. In the case of legacy gTLDs, 94 percent of the security threat domains were in just 4 of those gTLDs.

Preface

This monthly report to the ICANN Board of Directors highlights activities reported in the Domain Abuse Activity Reporting (DAAR) System, providing a snapshot as of 31 January 2018. The DAAR system studies domain name registration and security threat behavior across top-level domain (TLD) registries and ICANN-accredited registrars. This is a point-in-time report that includes data for all TLDs for which data was available. The report provides aggregated statistics and timeseries analysis about security threats of interest to DAAR[1] reported. In other words, this report provides analysis on domains that were identified as a security threat on 31 January 2018 only. While no single snapshot can capture trends or anomalies, historical data collected over time will show trends and can be used to identify anomalies for further study. For more information regarding data used in the DAAR monthly report check DAAR Context Document [1].

The overarching purpose of DAAR is to give the ICANN community reliable, persistent, and unbiased data using an open and community-vetted methodology that can be used to help inform policy discussions. To learn more about DAAR, visit the ICANN Domain Abuse Activity Reporting web page [2].

At this juncture, DAAR provides aggregated monthly gTLD registry reports only. Reporting about registrar portfolios requires domain name registration data to identify which domains are sponsored by which registrars. A collection system that will collect and analyze the necessary registrar data remains under development. We expect to add registrar reporting in future reports. Inclusion of country code TLD (ccTLD) registries, where the ccTLD registry information is voluntarily provided by the ccTLD administrator, is also planned for future releases.

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[1]The security threats of interest to DAAR for this report are: spam, phishing, malware distribution, and botnet command and control.

1 General Trends in New and Legacy TLDs

On 31 January 2018, DAAR collected zone data for legacy and new generic top-level domains (gTLDs)[2]. The table below summarizes the data captured on 31 January 2018 and indicates the changes from the data reported for the previous month.

Table 1: Monthly snapshot comparison

	Domains for which DAAR is collecting data		Domains for which one or more security threat incidents	
	TLDs	Resolving domains in those gTLDs	TLDs	Resolving domains in those gTLDs
31 January 2018	1221	185,025,982	390	184,410,170

As Figure 1 displays, approximately 89 percent of gTLD domain names were registered in legacy gTLDs launched before 2010[3]. Figure **??** shows that the distribution stays more or less similar over time.
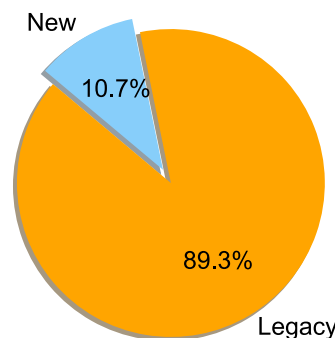

Figure 1: Distribution of resolving gTLD domains in zone files

1.1 Distribution of Domains Identified as Security Threats

Figure 2 illustrates the proportion of domains identified as security threats in percentages in legacy and new gTLDs. Of the 1,675,964 domains identified as security threats, 875,010 or 52 percent were in legacy gTLDs, and 800,954 or 47 percent were in the new gTLDs.
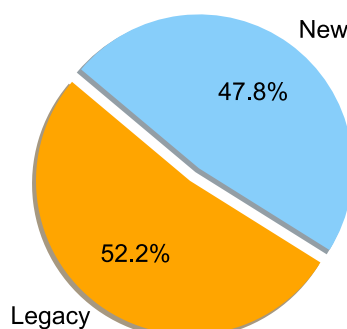

Figure 2: Distribution of domains identified as security threats

Domains identified as security threats in gTLDs are not uniformly distributed, either in the legacy or new gTLDs. The following graphs provide the cumulative distribution of domains reported

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[2] While DAAR can support analysis on country code TLDs (ccTLDs), at this time, no ccTLDs are included in DAAR reports.

[3] Certain legacy TLDs – specifically INT, EDU, MIL, GOV, and ARPA – do not appear in DAAR because they are not under ICANN gTLD contract and as such, zone data from these TLDs has not been included.

as security threats for the legacy gTLDs and the new gTLDs respectively. Note that given the number of new gTLDs is many times larger than the legacy gTLDs, the X-axes of the two graphs are significantly different. As can be seen from Figure 3a, of the 800,954 domains identified as security threats reported in 375 new gTLDs:

- 52 percent were in the 5 most-exploited new gTLDs.

- 72 percent were in the 10 most-exploited new gTLDs.

- 93 percent were in the 25 most-exploited new gTLDs.

- 99 percent were in the 50 most-exploited new gTLDs.
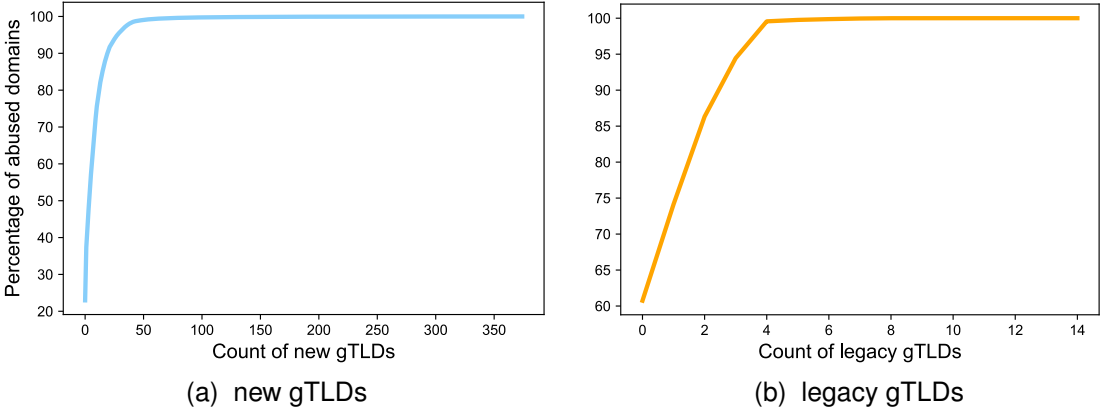

(a) new gTLDs

(b) legacy gTLDs

Figure 3: Cumulative distribution of domains identified as security threats

For legacy gTLDs, Figure 3b displays the distribution of domains identified as security threats across legacy gTLDs. 1 legacy gTLD alone is responsible for 60 percent of domains identified as security threats and in total 4 legacy gTLDs bare more than 94 percent of all domains identified as security threats.
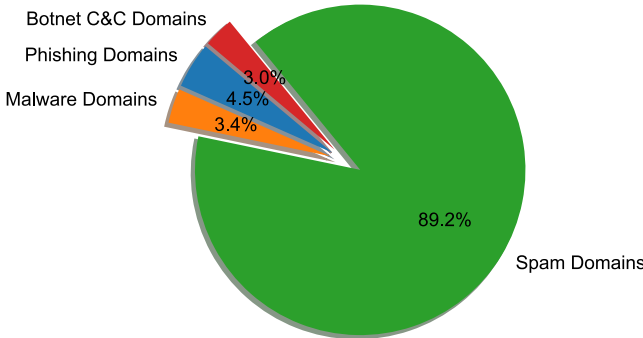

Figure 4: Breakdown of domains identified as security threats across all DAAR threat types

2 Breakdown of Individual Security Threats

DAAR uses DNS Reputation Provider feeds to identify domain names reported to be associated with four kinds of security threats: phishing, malware distribution, botnet command-and-control,

and spam. Figure 4 displays the breakdown of security threats from the DNS reputation data DAAR is utilizing[4]. Figure 5 shows the distribution of security threats across new and legacy gTLDs for these four threat types.
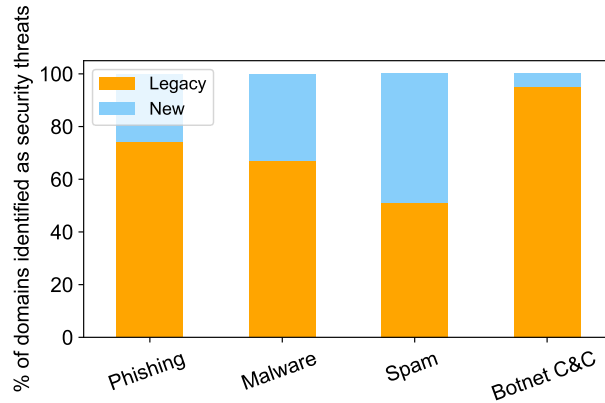

Figure 5: Proportion of domains identified as security threats within gTLD types

3 Normalized Metric: Percentage of Abuse

Figure 6 demonstrates the raw counts of domains identified as security threats (y-axis) versus domains resolved in gTLD zone files (x-axis). We use a logarithmic scale for the x-axis and y-axis to assist in visualizing the diverse counts of these two variables.
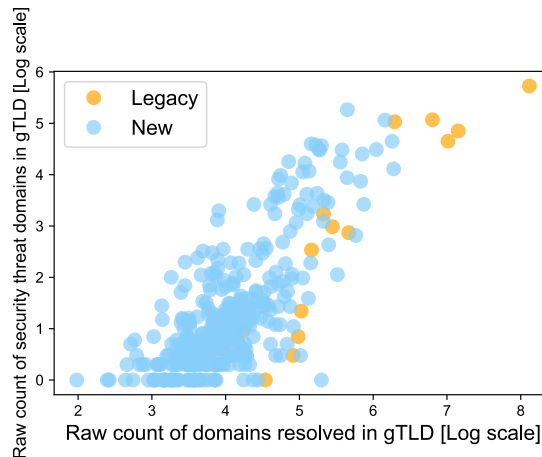

Figure 6: Raw counts of domains identified as security threat versus counts of resolved domains in gTLDs

Raw counts of domains identified as security threats do not necessarily reflect the extent to which a gTLD is the focus of exploitation by security threat actors, since each gTLD has different number of domains registered. For this reason, we calculate a normalized value, a percentage of abuse (P_{ab}). P_{ab} represents the percentage of domains that are listed for being a security threat in at least one of the DNS Reputation feeds DAAR utilizes, normalized by the amount of resolving domains within a given gTLD. For gTLDs, P_{ab} is determined as follows:

$$P_{ab} = (\frac{\text{Number of domains identified as security threats in TLD}}{\text{Number of resolving domains within TLD zone}}) \times 100$$

P_{ab} can be used to provide "apples to apples" comparisons for the number of resolving domains that are identified as security threats over time or between gTLDs. This information could help

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[4] The list of DNS Reputation Providers DAAR used for the generation of this report is included in the Appendix.

the TLD operators determine whether their anti-abuse measures are effective as well as help the ICANN community in making informed policy decisions regarding security threat mitigation.

The average P_{ab} for all 1221 gTLDs in DAAR for January 2018 is approximately 0.42 percent. Figure 7 illustrates the P_{ab} in these gTLDs. Circle size indicates the non-normalized (raw) count of domains identified as security threats.
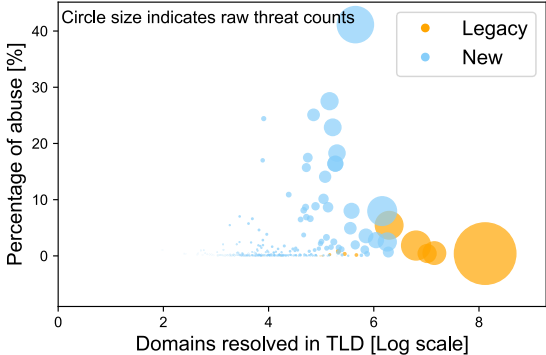
Figure 7: Percentage of abuse for domains identified as security threats vs. counts of domains resolved in gTLDs

4 Percentage of Abuse: Breakdown of Individual Security Threats

Figure 8 displays Percentage of abuse for domains identified as security threats versus domains resolved in new and legacy gTLDs for each of the security threats of interest to DAAR. Each dots represents a gTLD provider. The bigger the size of the circle the higher the absolute count of domains identified as security threats.
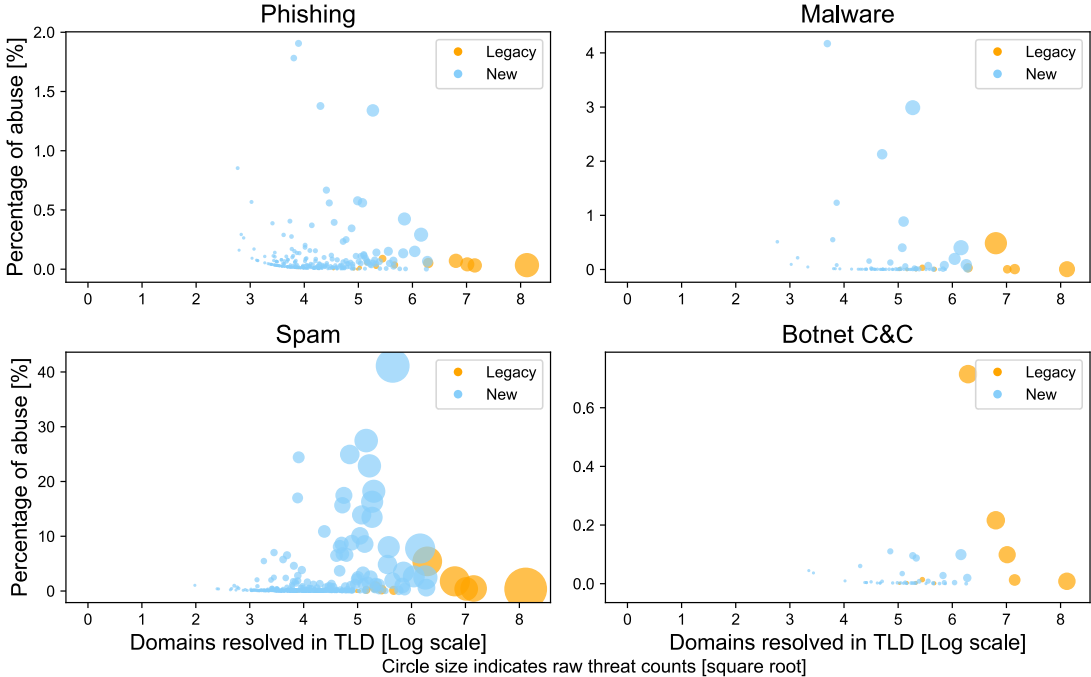
Figure 8: Percentage of abuse for domains identified as security threats vs. counts of resolved domains in gTLDs across different threat types

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References

[1] *Understanding the Domain Abuse Activity Reporting (DAAR) Monthly Report*. `https://www.icann.org/en/system/files/files/daar-monthly-report-04feb19-en.pdf`. Jan. 2019.

[2] *ICANN Domain Abuse Activity Reporting*. `https://www.icann.org/octo-ssr/daar`. Dec. 2018.

[3] *SURBL*. `http://www.surbl.org/lists`. Dec. 2018.

[4] *Spamhaus*. `https://www.spamhaus.org`. Dec. 2018.

[5] *Spamhaus Domain Block List (DBL)*. `https://www.spamhaus.org/faq/section/Spamhaus%20DBL#291`. Dec. 2018.

[6] *Anti-Phishing Working Group (APWG)*. `https://www.apwg.org`. Dec. 2018.

[7] *PhishTank*. `https://www.phishtank.com`. Dec. 2018.

[8] *Malware Patrol*. `https://www.malwarepatrol.net/enterprise-threat-data/`. Dec. 2018.

[9] *Abuse.ch*. `https://abuse.ch`. Dec. 2018.

[10] *Abuse.ch Feodo Tracker*. `https://feodotracker.abuse.ch`. Dec. 2018.

[11] *Abuse.ch Ransomware Tracker*. `https://ransomwaretracker.abuse.ch`. Dec. 2018.

Appendix

The table below provides a listing of the reputation providers and feeds used in the DAAR system along with their corresponding threat types.

Reputation provider	Feed used	Threat type
SURBL [3]	JwSpamSpy + Prolocation	Spam
	Sa-blacklist	Spam
	SpamCop	Spam
	AbuseButler	Spam
	Phishing domains	Phishing
	Malware domains	Malware
Spamhaus [4]	Domain Block List (DBL) [5]	Spam - Phishing - Malware - Botnet C&C
Anti-Phishing Working Group [6]	Phishing URLs	Phishing
PhishTank [7]	Phishing URLs	Phishing
Malware Patrol [8]	Malware URLs	Malware
	Ransomware URLs	Malware
	Botnet C&C URLs	Botnet C&C
Abuse.ch [9]	FeodoTracker [10]	Malware
	Ransomware Tracker [11]	Malware