An Analysis of Parking-Adjusted Registrations

Overall, in our discussion of the impact of new gTLDs on Competition, we treat all domains as equal. However, it is worth noting that the majority of domains in both legacy and new gTLDs are not the primary identifiers of typical websites. Instead, these domains are forwarded to other domains (including sub-domains), used only for email, monetized via advertising or simply do not resolve, perhaps held in reserve by speculators. These domains, for lack of a better term, are considered "parked." Using this expansive definition of parking, according to data compiled by nTLDstats, about 68% of registrations in new gTLDs are currently parked.[1] By way of comparison, 56% of registrations in legacy gTLDs are currently parked. Halvorsen et al ascribe parking to: (1) speculation in order to sell the domain later at a profit; (2) plans to develop the domain at a later date; or (3) unsuccessful development. [2] Examples of behaviors that could be considered parking include:

- The domain name does not resolve.

- The domain name resolves but attempts to connect via HTTP return an error message.

- HTTP connections are successful but the result is a page that displays advertisements, offers the domain for sale, or both. In a small number of cases, these pages may also be used as a vector to distribute malware.

- The page that is returned is empty or otherwise indicates that the registrant is not providing any content.

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[1] https://ntldstats.com/parking/tld (viewed on March 21, 2017).

[2] T. Halvorson, M.F. Der, I. Foster, S. Savage, L.K. Saul, and G.M. Voelker, "From .academy to .zone: An Analysis of the New TLD Land Rush," Proceedings of the 2015 ACM Conference on Internet Measurement Conference Metric.

- The page that is returned is a template provided by the registry with no customization offered by the registrant.
- The domain was registered by an affiliate of the registry operator and uses a standard template with no unique content.
- The domain redirects to another domain in a different TLD.

Of course, this represents a rather gross representation of "parking" as the implications for competition of each of these scenarios are likely different.

However, because the percentage of "parked" registrations in new gTLDs is so large, the Review Team sought to understand whether this phenomenon would affect its conclusions regarding the impact of the introduction of new gTLDs on the marketplace. Hypotheses could be advanced which suggest counting certain types of parked domains differently when computing market share and concentration. For example, one possible reason for taking parking rates into account is that registration renewal rates may be negatively correlated with rates of certain types of parking so that the current market shares of TLDs with relatively high parking rates may overstate their long run competitive significance. In such an instance, these new domains should be discounted at a rate commiserate to the correlation. Another hypothesis posits that domains used as pointers imply a transition away from an existing domain. In this case, the domains to which others are pointed should be discounted at some rate. Finally, it's possible that speculation has a pro-competitive effect, not captured directly by market share and concentration calculations, by bridging new entrants to maturity, which generally takes 3 years. Given the mandate to examine the impact of new gTLDs on competition, the first question is whether the rate of parking is substantially different in the new gTLDs than in the legacy gTLD space.

In order to better understand this topic, the Review Team used existing parking data for new gTLDs that nTLDstats routinely calculates. We also requested that ICANN contract with nTLDstats to develop parking data for legacy gTLDs especially for this project.[3] We used registration data for December 2016, the same month for which other statistics in this report are based, and the most comprehensive parking measure provided by nTLDstats, the aggregate of the 7 separate sources of parking that it identifies.[4]

Using this data, we made an initial comparison of overall parking rates between legacy and new gTLDs. nTLDstats estimated that the weighted average parking rate for legacy gTLDs in that month was approximately 56 percent and that the weighted average parking rate for new gTLDs in the same month was approximately 68 percent, a rate that is almost 20 percent higher than the parking rate for legacy gTLDs.[5] Again, we are not certain of the impact of parked domains on market rivalry but if parked domains are somehow less significant as markers of

[3]   nTLDstats applied its parking analysis to each legacy gTLD based on the number of names in its zone file. For TLDs with 10,000 names or fewer, nTLDstats analyzed all registered names, for TLDs with 10,001-100,000 names, nTLDstats analyzed 10% of registered names, and for TLDs with more than 100,000 names, nTLDstats analyzed 1% of registered names. nTLDstats also conducted a manual review of 10% of the total sample to check for false positives.

[4]   Specifically, we adjusted the number of registrations for each gTLD to reflect the number of registrations that were *not* parked, i.e., we calculated (1 minus the parking rate) times the number of registrations for each gTLD.

[5] 20 percent of 55.6=11.2 and 55.6 + 11.12= 66.72 (nearly 68%).

competition, this is a substantial difference that could affect the computation of our competition-related indicators.[6] [78]

Taking a cursory stab at understanding the potential significance of parking rates on future market shares , we attempted to determine whether there was a relationship between parking and renewal rates. In order to perform this analysis, we compared parking rates in each TLD as of December 2016 with a renewal rate computed based on registries' monthly

[6]   At one extreme, if we were to exclude parked registrations from our market share analysis entirely, we find a "non-parked" market share of new gTLD registrations as a portion of all gTLDs of 10.9 percent, approximately 23 percent lower than the 14.2 percent share when parked domains are included. Looked at another way, when parked domains are included, new gTLDs accounted for about 61 percent of the increase in all gTLD registrations between the start of the new gTLD program and December 2016 but only about 34 percent of the increase when parked domains are excluded entirely.] (Making a similar adjustment in our market concentration calculations did not make a meaningful difference between including or excluding parked domains.)

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transaction reports[9] for the period of July – December 2016[10]. Using a Pearson correlation

analysis, we were unable to find a statistically significant correlation between renewal rates and

parking rates in either new or legacy gTLDs. While the identification of a relationship would

have been interesting, the results of this test are, by no means, dispositive of a potential

correlation. We recommend more robust studies of this topic to better understand whether such a

relationship exists. Such studies could include, among other things, a closer examination of the

following factors: 1) what parking measures best measure market rivalry; 2) what renewal rates

should be used; 3) what factors other than parking are likely to affect renewal rates; 4) what is

the functional form (e.g., linear, logarithmic, etc. of the relationship between parking and

renewals; 5) what is the "lag" between parking and non-renewals (i.e., how much time is there

between the time that a domain name is parked and the time at which it is not renewed)?

Geographic Differences in Parking Behavior

The Review Team also sought to determine whether the quantity of parked domains

varied based on region. For example, *Latin American and Caribbean DNS   Marketplace*

9   Registries do not submit a renewal rate calculation to ICANN. Nevertheless,
given that second level domains auto-renew, we computed a renewal rate for each TLD by
dividing the number of renewal transactions by the sum of the deletion transactions (outside of
the add grace period) plus renewal transactions.

10   Monthly renewal rates can be quite volatile and represent only the portion of
domains eligible for renewal that month, whereas parking rates are calculated across all domains
in a TLD. Therefore, we used a six month period to calculate renewal rates in order to minimize
sample errors in our analysis

Study (LAC Study) reports that "across the entire region, 78% of the gTLD domain names are active, and 22% are not in use (either timing out, or no active services). By comparison, according to nTLDstats, across all new gTLDs approximately 33% of domains had no valid DNS or returned invalid HTTP responses.

Although the Review Team did not have the ability to directly correlate registrant addresses with parked domains, we did identify six of the top 50 largest new gTLDs that were in the Chinese language. According to data from nTLDstats, all of these Chinese language domains showed markedly higher parking rates than the average across all new gTLDs, with parking rates ranging from 71% for .wang to 93% for .xin. Table XX below indicates the parking rate for each of the six Chinese language TLDs in the top 50.

PARKING RATE (%)

ALL NEW GTLDS	58.97
.wang	71.29
.xin	93.49
(xn-ses554g)	82.57
(xn-p1acf)	76.49
(xn-vuq861b)	86

These initial analyses of geographically-based parking rates are quite cursory and based on limited data, but they do seem to indicate that regional variations in parking rates exist and can be quite significant.

Relationship Between Parking and DNS Abuse

While the Review Team was not able to identify a direct relationship between parking rates and either competition or consumer choice, we also considered the possibility that parked domains may be linked to Consumer Trust, and in particular to the possibility that parking is associated with DNS Abuse. Previously, Vissers et al[11] studied over eight million parked domains and found that "users who land on parked websites are exposed to malware, inappropriate content, and elaborate scams."[12] In conjunction with this Review, DNS Abuse Report found that...[INSERT DNS Abuse Findings]. Despite high rates of parking in new gTLDs, overall rates of malware propagation remain lower in new gTLDs than in legacy gTLDs, but this troubling correlation warrants further attention from the ICANN communi

11   Cite to Parking Sensors: Analyzing and Detecting Parked Domains

12   It is not entirely clear to the Review Team whether malware propagation is intentional by the parked sites or parking services, or the result of compromised ad networks. Vissers et al raise this possibility in their paper: "Possibly, these complex chains are the consequence of a process similar to ad arbitration, a widely adopted practice performed by most ad syndicators [33]. During this process, the syndicator bids on available ad slots of other publishers or syndicators, allowing them to resell these slots to the next bidder. Often, ad slots are subjected to multiple iterations of this reselling process. As a consequence, ad slots are no longer under control of the syndicator that the original publisher partnered with. All these interactions and intermediate parties have the potential to blur the direct involvement of the parking service in serving malware. In some cases, however, we also see malware being delivered more directly, for example, by the parent company of Parking Service 8."

Recommendations

While we observe that new gTLDs have higher parking (using the broadest possible definition) rates than legacy gTLDs and that there are regional variations in parking rates, it is so far unclear to us if parking has a meaningful effect on either competition or consumer choice. As a result, we recommend that ICANN consider undertaking further research into the potential competitive impact of domain parking and to use the results of that research to improve its analysis of developments in the DNS marketplace. In addition, we recommend that ICANN consider using data on upcoming registration deletes, which nTLDstats routinely collects for new gTLDs, for the same purpose.

Recommendation 5: Collect parking data.

Rationale/related findings: The high incidence of parked domains suggests an impact on the competitive landscape, but insufficient data frustrates efforts to analyze this impact.

To: ICANN organization

Prerequisite or Priority Level: High

Consensus within team: Yes

Details: ICANN should regularly track the proportion of TLDs that are parked with sufficient granularity to identify trends on a regional and global basis. Future reviews should conduct further analyses of whether there is a correlation between parked domains and renewal rates or other factors that may implicate competition.   Further analysis should be performed on the relationship between parking and DNS abuse.

Success Measures: The availability of relevant data for use by the ICANN organization, contractors and the ICANN community for its work in evaluating competition in the DNS space.