Analysing the Use of the RA & RD bits in DNS Requests to the Root Servers

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Abstract

One of the proposals for risk mitigation for the name collision problem is to block the registration of domain names that are already appearing in the DITL data held at DNS-OARC.[1] ICANN's rationale appears to be that since these names are found in the DITL datasets, something somewhere must be using these even though the corresponding top-level domain (TLD) has not been delegated in the root. If these specific domain names are blocked, requests for them will continue to get a NXDOMAIN response from the DNS once the TLD is delegated, just like they get at present. Therefore the addition of the new TLD would not change the behaviour of the clients and software that are already issuing requests for names in the new TLD.

However this approach makes simplifying assumptions about how the DNS is used that might not be correct. One of these assumptions is that DNS requests to the root only come from resolving name servers which can handle referral responses. There are however other types of DNS client such as stub resolvers and forwarding-only devices. If these query the root servers, they can receive referral responses that they are unable to process and that would result in undefined behaviour.

The object of this paper is to identify the level and nature of traffic from these naïve DNS clients and, if this is significant, assess the potential impact that could arise from the proposed name blocking approach.

[1] https://www.dns-oarc.net/oarc/data/ditl

1. Introduction

The potential of name collisions in the DNS has recently emerged as a concern for ICANN's plans to introduce new gTLDs. In outline, the problem arises from existing *ad-hoc* use of these gTLDs on the Internet. Once these gTLDs get delegated by ICANN, there is a possibility that the new names which get added will clash with those already being used informally. That may cause unexpected behaviour and/or confusion by taking end users and software to resources other than the ones they expected to reach.

Some analysis took place in 2013 to assess the extent of the problem. This largely focused on the incidence of these gTLD strings appearing in the DNS traffic sent to the Internet root servers that had been captured for the DITL project.

The outcome of that analysis was to divide the gTLD strings that had been applied for into three categories. Two, `.home` and `.corp`, were placed in the high risk category because they both already generate more DNS traffic than most existing TLDs. Some were considered low risk because the measured traffic level appears to be below a reasonable threshold for "background noise". The remainder were placed in an intermediate uncalculated risk category. ICANN reconsidered its initial assessment and decided that all but the two high risk gTLDs will be required to use risk mitigation techniques.

Although ICANN has still to finalise a risk mitigation framework, it has decided that blocking domain names is a viable strategy for the gTLD programme. The rationale is that each of these gTLDs can be given its own list of reserved domains: i.e. the strings appearing as second-level labels for that gTLD in the DITL data. If the gTLD registry prevents these names from being registered and the gTLD's name servers return NXDOMAIN, all should be well because the DNS will continue to behave as at present. Clients looking up these names will continue to be told they do not exist, just as happens now.

A possible problem with this approach is it makes assumptions about how the DNS behaves which might not be completely correct. This paper sets out to test those assumptions and check if they are valid or not.

For the purposes of this paper, "current TLD" or "existing TLD" means a TLD that was in existence prior to the opening of the latest gTLD round in 2012 and "new TLD" refers to those which ICANN intends to add. At the time the analysis for this paper took place some of those new gTLDs had already been delegated.

2. Overview of DNS Resolution

The conventional model for the DNS is a client, for instance a web browser, uses a stub resolver to send DNS queries to a local resolving server. This resolving server then makes iterative queries, starting at the root and working its way down the tree, in order to find the answer to return to the client. It does not matter which DNS server returns an NXDOMAIN response to indicate that some name being looked up does not exist. The stub resolver in the end client simply does not know (or care) if that response was sent by a root server or the name server from some TLD or one for somewhere else in the name space. The iterative resolving server gets that response and simply returns it to the client that had initiated the lookup.

For instance, when a web browser looks up `www.example.com`, its stub resolver sends the query to a local resolving name server. It makes an interative query to a root server which gives a referral to the name servers that are authoritative for the `.com` TLD. The resolving name server then processes that referral and makes another iterative query, this time to one of the `.com` name servers which then returns a referral to the `example.com` name servers. This process continues until the eventual answer is found or a relevant authoritative name server says the name being looked up does not exist.[2]

In principle it should not matter which name server returns NXDOMAIN when *example.gTLD* does not exist. In DNS terms there is no difference between an NXDOMAIN response from a root server and one from a name server for *.gTLD*. For the end client, the result is the same: their iterative resolver tells them that the name they looked up does not exist. So if *example.gTLD* had been found in the DITL data, the gTLD registry could be told to block that name and return NXDOMAIN. The DNS would then continue to return the same result as it does today. Therefore there should be no chance of a nasty surprise by taking the end user to a different *example.gTLD* from the one they might have reached prior to the delegation of the new gTLD.

This assumption underpins ICANN's current approach to gTLD delegation and risk mitiagtion. However it may be an incomplete one and that may have unintended consequences.

2.1. Other DNS Models

The conventional architecture of a stub resolver querying a local resolving server which then makes iterative queries to authoritative name servers is not the only one which is in use. Sometimes stub resolvers in edge devices get misconfigured and directly query authoritative name servers instead of a local resolving name server. Root name servers tend to be the target of these misconfigurations. Name servers can be configured to only forward queries rather than attempt to resolve the incoming lookups themselves. DNS forwarders and proxies are often found in CPE — DSL & cable modems for example — and these are sometimes unable to make iterative queries and handle referral responses either.[3] These too are known to forward their traffic to the Internet's root servers.

All of these devices won't handle referral responses correctly because they are usually not equipped to recognise or process them. If they receive a referral response, their behaviour is undefined. They might or might not give up and report an error. They might append some suffix or prefix to the domain name and make another lookup. In some cases, the software might fail or even crash.

2.2. Protocol Considerations

The RA bit (Recursion Available) in a DNS header is generally not set by a client. It may be returned by the responding name server to indicate to the client that the server is able to do recursion and therefore make iterative queries on

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[2] There are other DNS error codes and failure modes in this process. These are not germane to this discussion.

[3] In general CPE (Customer Premises Equipment) devices should be configured by an ISP to direct DNS requests to the ISP's resolving name servers. However this does not always happen.

behalf of its clients. The RD (Recursion Desired) bit is meant to be set on requests from clients that are not prepared to process referral responses and/or make iterative queries. Naïve clients such as stub resolvers and DNS forwarders generally set this bit on their outbound queries.

3. Analysis

For this paper, analysis of the DITL data has been divided into four parts. The first of these is a quantitative analysis: how often do the root servers get queries from devices that set the RD bit and presumably are not iterative resolvers? Which of the new gTLDs are most and least prone to that behaviour?

The next stage is to compare the results for the new gTLDs with those for existing TLDs: do the patterns of behaviour change or not and if so, why? A simple historical analysis was then carried out to see how traffic levels and patterns have changed since the DITL exercise began in 2006. i.e Has the pattern of behaviour changed over the years and if so, what might explain that?

Finally, some qualitative analysis was done. If significant levels of requests from non-iterative resolvers are found in the DITL datasets, can the source(s) of that traffic be identified? Is the traffic localised or diffuse? Could it be coming from specific models of devices or their firmware? Can these be identified?

4. Methodology

Three passes were made over the DITL datasets. The first counted the number of requests for each known TLD: i.e. the ones already in existence and those that were applied for under ICANN's new gTLD programme. Counts were also taken for the settings of the RA (Recursion Available) and RD (Recursion Desired) bits. Summary results are shown in Table A below and more detailed results are presented in Tables 1-24 in Section 8.

The second pass extracted each request that set the RD bit. The volume of data gathered from that exercise is impractical to present here, except in summary form for a small number of use cases. In addition there are other legal and policy problems which prevent those results from being published. That data was only used for some of the qualitative analysis: identifying the source of traffic that was of interest.

A third pass was required to identify query patterns for a DDoS (Distributed Denial of Service) attack on root servers. One of these attacks is known to send queries that set the RD bit. There was concern that this could have distorted the earlier results, particularly for existing TLDs, by artifically increasing the incidence of requests that set the RD bit.

It turned out that this concern was misplaced. The distinctive query IDs typical of this attack were found to be in line with an expected, quasi-random distribution of query IDs. These did not appear to be significantly over- or under-represented in the DITL data. For most years, fewer than 1% of the requests which set the RD bit fitted the pattern of this DDoS attack.

5. Initial Findings

Table A below summarises the results of that first pass over the DITL datasets. For each year, the total number of requests is shown. This is followed by a breakdown of the number and percentages of those requests according to

the settings of the RA and RD bits.

Clearly, almost none of the inbound requests set the RA bit. Around 12% of requests set the RD bit though this was as low as 6% in 2006 and around 25% in 2007 and 2010. That variation may be worth further study. However it is out of scope for this exercise.

Year	Total Requests	RA=0,RD=0 Requests	RA=0,RD=1 Requests	RA=1,RD=0 Requests	RA=1,RD=1 Requests
2006	2478343195	2327685249 93.92%	150427329 6.07%	5856 0.00%	224761 0.01%
2007	5153660537	3949413047 76.63%	1204205788 23.37%	31756 0.00%	9946 0.00%
2008	12678869969	10558792932 83.28%	2119965299 16.72%	2598 0.00%	109140 0.00%
2009	17466132042	15266723688 87.41%	2199398366 12.59%	710 0.00%	9278 0.00%
2010	37405164720	27945868141 74.71%	9459203848 25.29%	1793 0.00%	90938 0.00%
2011	22223154362	18756386606 84.40%	3466718229 15.60%	6426 0.00%	43101 0.00%
2012	18122258888	15746410170 86.89%	2375808048 13.11%	23270 0.00%	17400 0.00%
2013	18702086081	16733014776 89.47%	1966886684 10.52%	48338 0.00%	2136283 0.01%

Table A - Cumulative request counts, RA/RD settings and percentages

A complete breakdown per TLD of RA & RD bit settings and request counts for each year's DITL data is provided in an accompanying tarball. Summary results are given in Tables 1-16 below. These are sorted in decreasing order of the percentage of request traffic that set the RD bit. Tables 17-24 provide counts for the TLDs that get the most RD=1 requests.

The tables in Section 8 only present the top 40 TLDs, an arbitrary cut-off primarily for reasons of space. The full results in the accompanying tarball show that there are long tails of TLDs which have no requests which set the RD bit. There is little point in repeatedly presenting that information here.

An exhaustive analysis of RA and RD bit settings for every TLD and year of DITL data would require substantial resources and time. This would generate around 15,000 data sets — just under 2000 TLDs for 8 years — for comparison and assessment. Therefore simplifying assumptions were used to reduce the analysis to realistic levels. Firstly, only the obvious outliers found in the initial results were explored. Second, ICANN's original approach to the name collision problem was to consider 50,000 queries as the threshold for low risk. It seems reasonable to apply that metric to this analysis. These simplifying assumptions can always be revisited if further study is considered necessary,

Almost none of the DNS requests in the DITL data set the RA bit. This is to be expected because that header bit should only be set in responses from recursive resolvers. No further analysis of the RA bit setting was therefore carried out as there are no useful results which could be presented in this paper.

For the overwhelming majority of new gTLDs, very little request traffic set the RD bit. For many, the RD bit was never set at all. There were however some significant exceptions and these were analysed in more detail. Similarly, most of the existing TLDs did not get much traffic where the RD bit was set and again there were some notable exceptions. These are discussed in Section 5.4.

Tables 17-24 list the new TLDs and current TLDs that have the 40 highest counts of DNS requests that set RD=1 for each year's DITL data. It is clear that

`.home` and `.corp` are repeatedly the largest source of RD=1 requests amongst the new TLDs, usually in excess of ICANN's initial threshold for a low risk new gTLD. These have not been analysed further for this paper since both of these new gTLDs are effectively dead. Assuming ICANN's proposed risk framework is adopted `.home` and `.corp` will not get delegated and be permanently reserved.[4]

5.1. Quantitative Analysis

In general the incidence of traffic with the RD bit set is much higher for existing TLDs than for new gTLDs. The rate of RD=1 requests in Tables 1-8 tend to be 1% or less of the measured traffic, though there are some exceptions. Very few of these new TLDs cause RD=1 requests that exceed ICANN's initial threshold for low risk traffic. For existing TLDs, the rates of RD=1 requests shown in Tables 9-16 are far higher at 10-15% or more of the traffic for these TLDs. Almost all of them have RD=1 request rates above that ICANN threshold.

Although Tables 17-24 show the actual counts of requests and RD bit settings, it may be more useful to focus on the relative rates. i.e. A TLD which attracts a significant fraction of traffic with RD=1 may be more indicative of a potential problem than a TLD which has a higher number of requests where the RD bit is set but a much smaller proportion of the TLD's overall request traffic. In short if *TLD1* generated 1000 queries and all of these set the RD bit, that would probably deserve more attention than if there were 1000 queries which set this bit out of 1 million requests for *TLD2*.

As can be seen from Table 1-8, very few queries for new gTLDs arrive at the root where the RD bit is set. For the vast majority of these gTLDs, the percentage of queries to the root that set the RD bit is 1% or less. For many it is zero. [Full results are in the attached tarball.] This would tend to suggest that very few naïve DNS devices made queries to the root for the new gTLDs. Therefore, ICANN's strategy of a gTLD-specific block list at first glance appears to be generally acceptable. However there are some exceptions and significant outliers.

5.2. Comparative Analysis

Tables 1-24 show that the proportion of RD=1 requests for many existing TLDs is over ten times the ratio for new gTLDs. In addition the number of these requests is far higher for the existing TLDs, well in excess of ICANN's original low risk threshold. This strange and probably unwelcome traffic volume does not appear to cause any harm. Referral responses from the root for `.com` or `.arpa` do not seem to be creating problems for the possibly broken clients that are making queries with the RD bit set.

A reasonable explanation for the difference between the RD=1 requests for new and existing gTLDs might be that the installed base does not yet know about the new gTLDs and therefore does not generate much traffic for them.

The results for `.google` are perhaps the most noteworthy. The percentage of the queries for this new gTLD that have the RD bit set is substantially greater than for most other new gTLDs and this pattern of behaviour is found in 4 out of

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[4] http://www.icann.org/en/news/announcements/announcement-26feb14-en.htm

the last 5 years of DITL data: Tables 1, 3, 4 & 5. The volume of those queries tends to be somewhat high too: around 70,000 in 2013. This is higher than the threshold ICANN began to use to categorise low risk gTLDs.

Around 20 of the new TLDs have what may be non-trivial levels of traffic where the RD bit is set: 1% of the overall query rate or more. Some of these will require further investigation. Table 1 shows that in 2013 the RD bit is set on over 70% of the queries for `.statefarm`, 60% for `.thd` and 20% for `.sbs`. This is very unusual and could be a sign of a serious problem. It might also be explained by bad behaviour by a small number of rogue devices that were misconfigured. On the other hand, the number of queries for these gTLDs is quite small. These outliers are examined in more detail in Section 5.4.

5.3. Historical Analysis

Tables 1-8 show the counts and percentages of queries for the most prevalent new gTLDs for each year of DITL data between 2013 and 2006. Similar results are given in Tables 9-16 for current TLDs. The overall results are broadly similar and the tables for each year tend not to differ much. In other words, the same TLDs tend to be found at or close to the same positions year after year.

For each year, few new gTLDs were found to have meaningful levels of queries that set the RD bit. This tended not to change, suggesting that the behaviour of the DNS as a whole for these new gTLDs is fairly stable and consistent. There does not appear to be any shift that could be attributed to the addition or removal of some actor: for instance a public testbed for some new TLD.

The historical trends for existing TLDs are also fairly stable. That would tend to suggest that the incidence of naïve clients has not changed much since DITL began in 2006 and is probably unlikely to change much in the forseeable future.

It is of course possible that the actual behaviour of the DNS is different from what has been observed and analysed. The DITL datasets are by definition only snapshots. They do not contain a complete set of data from all root server operators (RSOs) or every instance of an anycast node that was active during the DITL data-gathering exercises. Since there is no other known repository of root server query traffic, the DITL datasets remain the most comprehensive source of authoritative data on DNS root server traffic. In addition, the 2013 Interisle report[5] showed a high level of uniformity in the query name patterns across the participating root servers. Therefore it would be reasonable to assume that traffic for the non-participating RSOs would also reflect the observed patterns. There was a consensus from the participating RSOs that the DITL data gathering interval provided a reasonably representative data sample because every edge device or resolving server a fair opportunity of appearing in the root server traffic.

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https://www.icann.org/en/about/staff/security/ssr/name-collision-02aug13-en.pdf

5.4. Qualitative Analysis

5.4.1. 2013 Data

Most of the RD=1 traffic for `.google` in 2013 came from a single IP address: 57,000 out of 70,000 requests. These lookups all used the same source port number and requested the same name. The query id pattern was odd too. Seven queries would use query id *N*. The next seven used *N+1* and so on. Presumably a poorly written application was in a loop issuing queries for `www.google` once a second or so, incrementing the query ID after every 7 lookups. This traffic seems to have originated from a Californian school. Reverse lookups of the address return a `k12.ca.us` domain name.

Almost all the RD=1 traffic relating to `.statefarm` in the 2013 DITL data came from a single IP address in a block allocated to an ISP/cable provider in New York State. The lookups used random query IDs but looked up names of the form *ipmonNN.statefarm*. There was no reverse DNS entry for this IP address. It was not possible to identify what was the root cause of this traffic. A reasonable guess would be the IP address is at a small branch office or perhaps the home office of a representative of the insurance company. State Farm's headquarters are in Illinois. The remainder of the `.statefarm` lookups had RFC1918 source addresses.

Over 90% of the queries for `.thd` came from a single IP address. This was in another block assigned to the same ISP/cable provider in New Your State. It was however a different IP address from before and there was no reverse DNS entrfy for it. These queries had randomised port numbers and query IDs. The QMEs were generally of the form *strgw.stNNN.thd*.

For `.sbs` in 2013, 30,000 of the 37,000 RD=1 queries came from a single IP address in a block allocated to a US ISP/cable provider. That address seems to be for a residential or small business customer. It seems reasonable to conclude a rogue application or misconfigured cable access device was the source of this traffic.

5.4.2. 2010 Data

Roughly 10% of the RD=1 lookups for `.google` domain names came from RFC1918 addresses in prefix 10/8. Almost all of these were for the QNAMEs `alt1.aspmx.l.google` and `alt2.aspmx.l.google`. A misconfigured application or stub resolver seems the most likely explanation. Presumably it was failing to append a suffix for an existing TLD and that was then compounded by the edge device or proxy failing to use a valid public IP address for the lookup.

One IP address generated 542 lookups for `gmail-smtp-in.l.google`, all using the same source port number. The Query IDs appeared to be random however. The remaining requests came from a few hundred /24s, each of which accounted for 30-60 lookups. This pattern was too diffuse for further analysis in the time and resources that were available. It is doubtful if further investigation of that traffic would be worthwhile.

5.4.3. 2008 Data

Half of the RD=1 requests for `.anz` come from a single /24 in Florida. The QNAMEs in nearly all of these lookups were bizarre. They were around 120 bytes long and contained 17 or 18 labels ending in `rozmaregi.anz`. The labels appear to be a mixture of non-words in anglicised Farsi or Arabic and English. Extracts from these QNAMEs included: `tasnimnewsroom.minevisam`, `rainingnight.sarzaminearezoh`, `parsiyanblog.momayez.urmtanha` and `bodybuilding.seven.mahmodkhan.ok2s3`. It is highly unlikely these lookups could have anything to do with the Australia and New Zealand Banking Group which applied for `.anz`.

The lookups for `.mail` were almost all for that one label and originated from a few hundred /24s, each of which generated 300-500 lookups. This pattern was too diffuse for further analysis in the time and resources that were available. It seems unlikely that there would be much benefit from deeper analysis of this behaviour.

Just under 60,000 of the RD=1 request for `.site` came from a single IP address. These all had the same source port number, a query ID of 0 and the same QNAME, `klingon.site`.[6] This IP address is allocated to the University of Toronto. A rogue application or badly written student programming assignment might well be responsible for this traffic. There is no reverse DNS entry for the IP address and it seems unlikely that the university's network administrator would be able to identify what was using that IP address during the DITL exercise 6 years ago.

6. Conclusions

Perhaps the most surprising result of this analysis is that a substantial proportion of the root server request traffic sets the RD bit, typically 12% of the lookups for known TLDs. It is not known however what is responsible for that traffic. One explanation could be faulty implementations of a DNS resolving server and these set this bit even though the server is capable of making iterative queries and dealing with referral responses. The other explanation is there are many naïve DNS clients — stub resolvers, forwarding only servers and proxies, etc. — which are mistakenly sending traffic to the root.

It is remarkable that this traffic does not appear to be causing any significant problems. If clients were failing because they receive referral responses, this would be well known. There are just too many of these responses being returned for significant failures to go undetected for long. The conclusion to draw from that is referral responses from the root servers do not appear to break anything important. Presumably naïve DNS clients either ignore these and fail safe or else work around them somehow.

The incidence of RD=1 requests for new gTLDs is generally far lower, both in absolute and relative terms, than it is for existing gTLDs. For most new gTLDs, the level of RD=1 requests is zero. For those where the rate is non-zero, it is usually at least one order of magnitude lower than the rates found in the most heavily used existing TLDs.

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[6] It is not known if phasers or dilithium crystals were involved.

When high or unusual levels of RD=1 requests have been found for new gTLDs the issues are often localised, sometimes to a single IP address or /24 prefix. This analysis has not been able to identify instances of actual or potential harm resulting from this traffic or that ICANN's proposal for blocking name registrations will cause operational problems for the installed base.

The logical conclusion of this analysis is simple: ICANN's plan for risk mitigation is unlikely to create problems for naïve DNS clients that shouldn't be querying the root.

7. Acknowledgements

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8. Summary Results

Table 1 - RD bit usage in 2013 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
statefarm	2524	730	28.922%	1794	71.078%
thd	14669	5799	39.532%	8870	60.468%
sbs	167539	133289	79.557%	34250	20.443%
rexroth	21	19	90.476%	2	9.524%
studio	172005	162175	94.285%	9830	5.715%
google	1655531	1586495	95.830%	69036	4.170%
chat	47394	45714	96.455%	1680	3.545%
kone	1868	1810	96.895%	58	3.105%
dabur	38	37	97.368%	1	2.632%
pwc	51672	50525	97.780%	1147	2.220%
red	933745	913899	97.875%	19846	2.125%
rio	34750	34203	98.426%	547	1.574%
ricoh	4267	4211	98.688%	56	1.312%
tvs	65161	64347	98.751%	814	1.249%
vig	7828	7734	98.799%	94	1.201%
buy	12251	12117	98.906%	134	1.094%
hdfcbank	1126	1114	98.934%	12	1.066%
nfl	5734	5675	98.971%	59	1.029%
saarland	658	652	99.088%	6	0.912%
panasonic	9238	9171	99.275%	67	0.725%
godaddy	2105	2090	99.287%	15	0.713%
kyoto	6328	6288	99.368%	40	0.632%
flir	159	158	99.371%	1	0.629%
vlaanderen	1288	1280	99.379%	8	0.621%
commbank	893	888	99.440%	5	0.560%
dupont	7640	7598	99.450%	42	0.550%
scholarships	194	193	99.485%	1	0.515%
zippo	1171	1165	99.488%	6	0.512%
vons	197	196	99.492%	1	0.508%
sina	148018	147286	99.505%	732	0.495%
sohu	52170	51915	99.511%	255	0.489%
svr	105734	105223	99.517%	511	0.483%
mcd	26258	26135	99.532%	123	0.468%
ultrabook	1292	1286	99.536%	6	0.464%
kindle	1576	1569	99.556%	7	0.444%
islam	5046	5024	99.564%	22	0.436%
voyage	12268	12217	99.584%	51	0.416%
reviews	1216	1211	99.589%	5	0.411%
nikon	1461	1455	99.589%	6	0.411%
mtn	19876	19795	99.592%	81	0.408%

Table 2 - RD bit usage in 2012 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
now	100468	92579	92.148%	7889	7.852%
whoswho	21	20	95.238%	1	4.762%
svr	134749	129707	96.258%	5042	3.742%
studio	174830	168293	96.261%	6537	3.739%
docs	8860	8538	96.366%	322	3.634%
xn--io0a7i	1874	1818	97.012%	56	2.988%
new	639446	622464	97.344%	16982	2.656%
statefarm	1111	1082	97.390%	29	2.610%
xn--c2br7g	213	208	97.653%	5	2.347%
canalplus	301	294	97.674%	7	2.326%
tips	5985	5872	98.112%	113	1.888%
pwc	44537	43701	98.123%	836	1.877%
capital	28915	28408	98.247%	507	1.753%
honeywell	2329	2290	98.325%	39	1.675%
statebank	62	61	98.387%	1	1.613%
hdfcbank	1337	1318	98.579%	19	1.421%
tatamotors	309	305	98.706%	4	1.294%
taobao	99011	97754	98.730%	1257	1.270%
google	1503142	1485251	98.810%	17891	1.190%
weatherchannel	443	438	98.871%	5	1.129%
smile	20044	19828	98.922%	216	1.078%
thd	3096	3063	98.934%	33	1.066%
sina	100844	99778	98.943%	1066	1.057%
reviews	951	941	98.948%	10	1.052%
digital	97393	96383	98.963%	1010	1.037%
chat	29065	28772	98.992%	293	1.008%
contact	20070	19881	99.058%	189	0.942%
place	30596	30315	99.082%	281	0.918%
xn--55qx5d	2877	2851	99.096%	26	0.904%
nfl	7142	7078	99.104%	64	0.896%
motorcycles	360	357	99.167%	3	0.833%
florist	241	239	99.170%	2	0.830%
wtc	6515	6463	99.202%	52	0.798%
buy	12909	12806	99.202%	103	0.798%
hdfc	1756	1742	99.203%	14	0.797%
sohu	112709	111822	99.213%	887	0.787%
ricoh	6323	6275	99.241%	48	0.759%
yellowpages	1857	1843	99.246%	14	0.754%
medical	290672	288524	99.261%	2148	0.739%
panasonic	9811	9744	99.317%	67	0.683%

Table 3 - RD bit usage in 2011 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
band	15693	13595	86.631%	2098	13.369%
foundation	10397	9015	86.708%	1382	13.292%
xn--io0a7i	13091	11449	87.457%	1642	12.543%
xn--55qx5d	17371	15630	89.978%	1741	10.022%
aig	5931	5353	90.255%	578	9.745%
sbi	55894	52233	93.450%	3661	6.550%
are	20878	20234	96.915%	644	3.085%
sina	130542	126820	97.149%	3722	2.851%
pwc	38261	37227	97.298%	1034	2.702%
studio	217149	212646	97.926%	4503	2.074%
google	1404068	1377658	98.119%	26410	1.881%
dtv	9262	9101	98.262%	161	1.738%
college	153630	151621	98.692%	2009	1.308%
trust	18720	18486	98.750%	234	1.250%
cialis	164	162	98.780%	2	1.220%
london	112273	110951	98.823%	1322	1.177%
docs	12273	12143	98.941%	130	1.059%
online	131308	130054	99.045%	1254	0.955%
panasonic	8148	8073	99.080%	75	0.920%
audible	326	323	99.080%	3	0.920%
msd	588075	583003	99.138%	5072	0.862%
gal	57750	57257	99.146%	493	0.854%
capital	44236	43862	99.155%	374	0.845%
calvinklein	124	123	99.194%	1	0.806%
recipes	748	742	99.198%	6	0.802%
author	1033	1025	99.226%	8	0.774%
kone	21289	21125	99.230%	164	0.770%
mail	1282825	1273339	99.261%	9486	0.739%
yellowpages	3632	3606	99.284%	26	0.716%
honeywell	5985	5943	99.298%	42	0.702%
ricoh	10639	10566	99.314%	73	0.686%
realty	6021	5980	99.319%	41	0.681%
weatherchannel	1040	1033	99.327%	7	0.673%
cab	78552	78029	99.334%	523	0.666%
itau	258053	256351	99.340%	1702	0.660%
wolterskluwer	153	152	99.346%	1	0.654%
contact	16786	16677	99.351%	109	0.649%
new	525474	522163	99.370%	3311	0.630%
axis	24785	24630	99.375%	155	0.625%
place	32207	32007	99.379%	200	0.621%

Table 4 - RD bit usage in 2010 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
firmdale	28	10	35.714%	18	64.286%
ubank	441	183	41.497%	258	58.503%
gap	24366	21365	87.684%	3001	12.316%
xyz	260763	240676	92.297%	20087	7.703%
rmit	655	628	95.878%	27	4.122%
eus	2771	2665	96.175%	106	3.825%
cialis	240	231	96.250%	9	3.750%
google	1475699	1424352	96.520%	51347	3.480%
here	246501	239091	96.994%	7410	3.006%
showtime	2392	2350	98.244%	42	1.756%
kone	10664	10485	98.321%	179	1.679%
mail	1668107	1641664	98.415%	26443	1.585%
paris	98792	97502	98.694%	1290	1.306%
construction	33640	33202	98.698%	438	1.302%
ruhr	3091	3051	98.706%	40	1.294%
place	25119	24807	98.758%	312	1.242%
pwc	41705	41212	98.818%	493	1.182%
gal	45484	44992	98.918%	492	1.082%
army	40472	40039	98.930%	433	1.070%
krd	10783	10677	99.017%	106	0.983%
saarland	214	212	99.065%	2	0.935%
asda	5344	5296	99.102%	48	0.898%
email	61207	60680	99.139%	527	0.861%
studio	197189	195493	99.140%	1696	0.860%
trv	3305	3278	99.183%	27	0.817%
xn--io0a7i	1104	1095	99.185%	9	0.815%
tunes	929	922	99.247%	7	0.753%
panasonic	7179	7125	99.248%	54	0.752%
shia	1525	1514	99.279%	11	0.721%
tires	301	299	99.336%	2	0.664%
plus	154713	153760	99.384%	953	0.616%
ford	33574	33375	99.407%	199	0.593%
eat	7371	7330	99.444%	41	0.556%
bom	127656	126971	99.463%	685	0.537%
wtc	9551	9500	99.466%	51	0.534%
gent	6394	6360	99.468%	34	0.532%
bofa	1138	1132	99.473%	6	0.527%
ieee	2931	2916	99.488%	15	0.512%
capital	52602	52334	99.491%	268	0.509%
sport	66501	66166	99.496%	335	0.504%

Table 5 - RD bit usage in 2009 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
ubank	548	101	18.431%	447	81.569%
xn--55qx5d	2031	577	28.410%	1454	71.590%
xn--io0a7i	1731	526	30.387%	1205	69.613%
firmdale	82	41	50.000%	41	50.000%
guru	13954	9130	65.429%	4824	34.571%
lundbeck	14	11	78.571%	3	21.429%
reliance	13555	11699	86.308%	1856	13.692%
now	44910	40447	90.062%	4463	9.938%
origins	96	87	90.625%	9	9.375%
netaporter	63	60	95.238%	3	4.762%
kpmg	2801	2669	95.287%	132	4.713%
hdfcbank	655	628	95.878%	27	4.122%
google	723649	694016	95.905%	29633	4.095%
tatamotors	194	189	97.423%	5	2.577%
gallery	5941	5791	97.475%	150	2.525%
mail	1499829	1463011	97.545%	36818	2.455%
gal	23152	22604	97.633%	548	2.367%
adac	822	803	97.689%	19	2.311%
frontdoor	210	206	98.095%	4	1.905%
reise	710	697	98.169%	13	1.831%
style	4597	4517	98.260%	80	1.740%
condos	58	57	98.276%	1	1.724%
wedding	536	527	98.321%	9	1.679%
pwc	43448	42765	98.428%	683	1.572%
stc	32368	31898	98.548%	470	1.452%
warman	234	231	98.718%	3	1.282%
swatch	234	231	98.718%	3	1.282%
forsale	79	78	98.734%	1	1.266%
menu	1361	1344	98.751%	17	1.249%
network	2289069	2261872	98.812%	27197	1.188%
cafe	65430	64727	98.926%	703	1.074%
here	266000	263184	98.941%	2816	1.059%
audible	195	193	98.974%	2	1.026%
ril	1244	1232	99.035%	12	0.965%
shop	74878	74210	99.108%	668	0.892%
hosting	65187	64623	99.135%	564	0.865%
sling	116	115	99.138%	1	0.862%
ventures	612	607	99.183%	5	0.817%
alfaromeo	259	257	99.228%	2	0.772%
associates	23487	23307	99.234%	180	0.766%

Table 6 - RD bit usage in 2008 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
anz	78029	14632	18.752%	63397	81.248%
idn	19082	18264	95.713%	818	4.287%
vanish	26	25	96.154%	1	3.846%
bargains	27	26	96.296%	1	3.704%
gal	13279	12819	96.536%	460	3.464%
gallery	6447	6292	97.596%	155	2.404%
mail	2096605	2046810	97.625%	49795	2.375%
studio	91649	89917	98.110%	1732	1.890%
pfizer	1067	1047	98.126%	20	1.874%
finish	113	111	98.230%	2	1.770%
xn--c1avg	396	389	98.232%	7	1.768%
network	1369418	1346412	98.320%	23006	1.680%
lamborghini	136	134	98.529%	2	1.471%
jprs	68	67	98.529%	1	1.471%
agency	9583	9449	98.602%	134	1.398%
shop	62615	61893	98.847%	722	1.153%
email	77409	76561	98.905%	848	1.095%
jetzt	366	362	98.907%	4	1.093%
marketing	20795	20568	98.908%	227	1.092%
bible	1508	1493	99.005%	15	0.995%
show	14567	14428	99.046%	139	0.954%
xyz	761696	754436	99.047%	7260	0.953%
google	406953	403105	99.054%	3848	0.946%
xn--55qx5d	2006	1988	99.103%	18	0.897%
hotels	12764	12656	99.154%	108	0.846%
download	8004	7944	99.250%	60	0.750%
zero	23493	23319	99.259%	174	0.741%
ren	11394	11312	99.280%	82	0.720%
xn--io0a7i	1744	1732	99.312%	12	0.688%
site	9518913	9455007	99.329%	63906	0.671%
photography	2036	2024	99.411%	12	0.589%
xn--j1aef	343	341	99.417%	2	0.583%
photos	1949	1938	99.436%	11	0.564%
bnpparibas	765	761	99.477%	4	0.523%
bet	140515	139801	99.492%	714	0.508%
aco	2210	2199	99.502%	11	0.498%
foo	137251	136583	99.513%	668	0.487%
yokohama	8355	8319	99.569%	36	0.431%
phone	11554	11508	99.602%	46	0.398%
new	171324	170645	99.604%	679	0.396%

Table 7 - RD bit usage in 2007 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
firmdale	28	0	0.000%	28	100.000%
legal	19918	11474	57.606%	8444	42.394%
voting	4	3	75.000%	1	25.000%
lgbt	5	4	80.000%	1	20.000%
academy	26652	22860	85.772%	3792	14.228%
university	3308	2925	88.422%	383	11.578%
doha	2433	2165	88.985%	268	11.015%
quebec	974	879	90.246%	95	9.754%
xn--42c2d9a	13	12	92.308%	1	7.692%
rocher	185	171	92.432%	14	7.568%
airtel	73211	67803	92.613%	5408	7.387%
berlin	43186	40088	92.826%	3098	7.174%
akdn	14	13	92.857%	1	7.143%
ieee	509	476	93.517%	33	6.483%
ollo	32	30	93.750%	2	6.250%
dstv	37	35	94.595%	2	5.405%
wme	207	196	94.686%	11	5.314%
network	522291	495182	94.810%	27109	5.190%
dish	166	158	95.181%	8	4.819%
gotv	22	21	95.455%	1	4.545%
tdk	856	818	95.561%	38	4.439%
doosan	1007	965	95.829%	42	4.171%
nyc	17871	17140	95.910%	731	4.090%
hdfc	200	192	96.000%	8	4.000%
jeep	3373	3240	96.057%	133	3.943%
hair	408	392	96.078%	16	3.922%
aarp	1595	1534	96.176%	61	3.824%
hbo	6586	6339	96.250%	247	3.750%
live	229759	221301	96.319%	8458	3.681%
godaddy	136	131	96.324%	5	3.676%
industries	2101	2027	96.478%	74	3.522%
select	2443	2357	96.480%	86	3.520%
buy	6836	6597	96.504%	239	3.496%
fan	5433	5251	96.650%	182	3.350%
hgtv	2278	2202	96.664%	76	3.336%
kone	1115	1078	96.682%	37	3.318%
qvc	3625	3508	96.772%	117	3.228%
finish	31	30	96.774%	1	3.226%
stockholm	842	815	96.793%	27	3.207%
imdb	19192	18582	96.822%	610	3.178%

Table 8 - RD bit usage in 2006 requests to the root for new gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
gmo	552	534	96.739%	18	3.261%
art	63647	61603	96.789%	2044	3.211%
network	465767	451166	96.865%	14601	3.135%
farmers	2337	2288	97.903%	49	2.097%
school	178449	174991	98.062%	3458	1.938%
wedding	580	570	98.276%	10	1.724%
dental	38342	37703	98.333%	639	1.667%
xn--io0a7i	61	60	98.361%	1	1.639%
scor	73	72	98.630%	1	1.370%
latrobe	73	72	98.630%	1	1.370%
fujitsu	3071	3037	98.893%	34	1.107%
ubs	3042	3010	98.948%	32	1.052%
blog	5477	5420	98.959%	57	1.041%
kone	493	488	98.986%	5	1.014%
lamborghini	100	99	99.000%	1	1.000%
boehringer	357	354	99.160%	3	0.840%
agency	4326	4292	99.214%	34	0.786%
csc	47941	47667	99.428%	274	0.572%
goo	54165	53903	99.516%	262	0.484%
tube	220	219	99.545%	1	0.455%
mortgage	6771	6741	99.557%	30	0.443%
jcb	953	949	99.580%	4	0.420%
prod	795779	792753	99.620%	3026	0.380%
srl	9808	9773	99.643%	35	0.357%
soccer	1489	1484	99.664%	5	0.336%
grainger	307	306	99.674%	1	0.326%
flickr	322	321	99.689%	1	0.311%
commbank	322	321	99.689%	1	0.311%
google	161691	161218	99.707%	473	0.293%
lifestyle	345	344	99.710%	1	0.290%
aco	1078	1075	99.722%	3	0.278%
nyc	13031	12995	99.724%	36	0.276%
promo	779	777	99.743%	2	0.257%
iinet	2871	2864	99.756%	7	0.244%
express	12078	12049	99.760%	29	0.240%
help	7117	7100	99.761%	17	0.239%
prof	1290	1287	99.767%	3	0.233%
beauty	868	866	99.770%	2	0.230%
solutions	8348	8329	99.772%	19	0.228%
berlin	39009	38921	99.774%	88	0.226%

Table 9 - RD bit usage in 2013 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
gr	39216273	27747325	70.755%	11468935	29.245%
arpa	674363221	494774774	73.369%	179576927	26.629%
ad	4008609	2968970	74.065%	1039638	25.935%
pt	23974604	19924565	83.107%	4050032	16.893%
gov	74242098	62113178	83.663%	12128147	16.336%
in	76777494	64263323	83.701%	12513905	16.299%
me	69631496	58532417	84.060%	11098879	15.939%
by	7906637	6665360	84.301%	1241237	15.699%
ee	6328667	5356654	84.641%	972010	15.359%
ru	337778423	291289327	86.237%	46488046	13.763%
com	6757754131	5835015202	86.345%	920763506	13.625%
cc	67668186	58582049	86.573%	9085938	13.427%
cn	318967146	276716217	86.754%	42250835	13.246%
to	11992831	10434102	87.003%	1558719	12.997%
am	6556377	5711532	87.114%	844830	12.886%
kz	12340406	10770650	87.280%	1569727	12.720%
name	6539374	5741890	87.805%	797483	12.195%
lv	9628382	8511983	88.405%	1116394	11.595%
org	874639995	774580136	88.560%	100046835	11.439%
net	4035779817	3602667515	89.268%	432957140	10.728%
es	61820478	55733808	90.154%	6086565	9.846%
xxx	829104	747800	90.194%	81302	9.806%
rw	839854	758474	90.310%	81380	9.690%
cx	3447607	3121813	90.550%	325787	9.450%
tw	105973397	96204017	90.781%	9769352	9.219%
su	15923477	14456958	90.790%	1466487	9.210%
lt	15347532	13991948	91.167%	1355576	8.833%
ht	1189360	1085066	91.231%	104294	8.769%
ua	64874324	59228362	91.297%	5645888	8.703%
aero	1199010	1096369	91.440%	102641	8.560%
pro	3936121	3607361	91.648%	328749	8.352%
kw	1746954	1602534	91.733%	144419	8.267%
mr	340099	312038	91.749%	28061	8.251%
gt	3789596	3486324	91.997%	303272	8.003%
mx	36362861	33805260	92.966%	2557557	7.033%
al	1455448	1353164	92.972%	102282	7.028%
fr	84914293	79081597	93.131%	5832401	6.869%
nu	4612487	4295735	93.133%	316752	6.867%
dk	28247720	26316767	93.164%	1930928	6.836%
cz	46933471	43830676	93.389%	3102737	6.611%

Table 10 - RD bit usage in 2012 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
tk	10631397	4622122	43.476%	6009275	56.524%
arpa	840354652	404438312	48.127%	435913325	51.873%
ad	2929737	1671636	57.058%	1258101	42.942%
rs	20842710	13391872	64.252%	7450838	35.748%
la	2697912	1949976	72.277%	747936	27.723%
gov	82050926	59306227	72.280%	22742675	27.718%
kz	8906239	6710514	75.346%	2195723	24.654%
ru	405781612	314001100	77.382%	91779056	22.618%
cn	284164352	221931617	78.100%	62232684	21.900%
pro	3489266	2870196	82.258%	619066	17.742%
nu	4615803	3837729	83.143%	778068	16.857%
by	5520780	4618618	83.659%	902160	16.341%
name	6103310	5114725	83.802%	988583	16.197%
dk	29533927	24776550	83.892%	4757361	16.108%
lv	11380219	9639753	84.706%	1740460	15.294%
in	93179142	78975508	84.757%	14203544	15.243%
tw	90424360	77529335	85.739%	12895017	14.261%
cat	1761743	1510633	85.747%	251109	14.253%
ge	1867942	1608907	86.133%	259035	13.867%
com	6830303345	5898102652	86.352%	932184407	13.648%
no	21651766	18724467	86.480%	2927289	13.520%
lt	14244562	12347411	86.682%	1897150	13.318%
org	759472329	658524770	86.708%	100944347	13.291%
ua	62036886	53951120	86.966%	8085730	13.034%
su	29702096	25854894	87.047%	3847187	12.953%
mt	1632808	1423326	87.170%	209482	12.830%
bg	13234283	11579607	87.497%	1654667	12.503%
az	1962514	1717843	87.533%	244671	12.467%
ie	11037816	9666711	87.578%	1371102	12.422%
sk	13970399	12294834	88.006%	1675565	11.994%
fi	24984949	21990571	88.015%	2994369	11.985%
is	4925559	4343164	88.176%	582395	11.824%
cz	53070690	46827162	88.235%	6243496	11.764%
gs	4415670	3898052	88.278%	517618	11.722%
cx	3148314	2780143	88.306%	368169	11.694%
fr	74961337	66314433	88.465%	8646652	11.535%
nl	130022169	115256216	88.644%	14765827	11.356%
as	1644727	1463826	89.001%	180901	10.999%
net	3798836082	3390082094	89.240%	408747691	10.760%
cy	1776473	1590469	89.530%	186003	10.470%

Table 11 - RD bit usage in 2011 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
ad	13753044	2530286	18.398%	11222756	81.602%
arpa	2326857815	709808166	30.505%	1617043916	69.495%
gg	1460096	1001616	68.599%	458480	31.401%
ru	532428918	373270220	70.107%	159154051	29.892%
su	30818272	23196646	75.269%	7621575	24.731%
kz	9807046	7664282	78.151%	2142757	21.849%
pt	33596182	28313432	84.276%	5282749	15.724%
ua	94402334	80879768	85.676%	13522542	14.324%
name	11054897	9507202	86.000%	1547684	14.000%
xn--ygbi2ammx	819	709	86.569%	110	13.431%
xn--fzc2c9e2c	454	396	87.225%	58	12.775%
com	7336748012	6443727170	87.828%	892990895	12.171%
xn--xkc2al3hye2a	181	159	87.845%	22	12.155%
org	873247098	769952765	88.171%	103293673	11.829%
tv	50779344	46090365	90.766%	4688975	9.234%
fi	32087702	29304679	91.327%	2783015	8.673%
kg	2711916	2478837	91.405%	233079	8.595%
net	4528304249	4143437144	91.501%	384862113	8.499%
de	240741287	220602371	91.635%	20138807	8.365%
ar	47195551	43440763	92.044%	3754758	7.956%
th	26669178	24591067	92.208%	2078110	7.792%
dk	56032307	51733705	92.328%	4298588	7.672%
tk	41802766	38656632	92.474%	3146126	7.526%
az	2818881	2610875	92.621%	208002	7.379%
pro	3421736	3175842	92.814%	245888	7.186%
biz	384682773	357129523	92.837%	27553086	7.163%
gov	66794911	62012843	92.841%	4781696	7.159%
by	10578612	9822440	92.852%	756166	7.148%
nl	132210650	122986508	93.023%	9224071	6.977%
ge	2646547	2464599	93.125%	181948	6.875%
fm	5105709	4755015	93.131%	350690	6.869%
xn--mgberp4a5d4ar	2135	1990	93.208%	145	6.792%
eu	66299756	61857713	93.300%	4442008	6.700%
uk	212997903	198812878	93.340%	14184774	6.660%
asia	2945626	2758033	93.631%	187593	6.369%
al	1721152	1613102	93.722%	108050	6.278%
sk	14856859	13958898	93.956%	897956	6.044%
it	111706245	104994029	93.991%	6712190	6.009%
in	60840921	57212335	94.036%	3628387	5.964%
et	1321120	1242403	94.042%	78717	5.958%

Table 12 - RD bit usage in 2010 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
com	16281653616	8621001646	52.949%	7660638370	47.051%
mp	1433701	869382	60.639%	564319	39.361%
pw	868174	573050	66.006%	295124	33.994%
mq	169154	118260	69.913%	50894	30.087%
bb	481864	365351	75.820%	116513	24.180%
kp	58690	44593	75.981%	14097	24.019%
sj	38607	29445	76.269%	9162	23.731%
mh	57017	43895	76.986%	13122	23.014%
gf	194680	152031	78.093%	42649	21.907%
bv	48451	37899	78.221%	10552	21.779%
arpa	3502445234	2743133421	78.321%	759276074	21.678%
fk	221330	173936	78.587%	47394	21.413%
yt	36509	28730	78.693%	7779	21.307%
bi	1272127	1001683	78.741%	270444	21.259%
mc	2280745	1817027	79.668%	463718	20.332%
sr	500576	399798	79.868%	100778	20.132%
coop	2197068	1756228	79.935%	440840	20.065%
pg	1664972	1331879	79.994%	333093	20.006%
gg	1440254	1169078	81.172%	271176	18.828%
pa	2774784	2254171	81.238%	520613	18.762%
gn	156446	127511	81.505%	28935	18.495%
gi	787501	642119	81.539%	145382	18.461%
as	3435391	2853667	83.067%	581724	16.933%
tn	2644776	2197126	83.074%	447630	16.925%
ky	1159995	964045	83.108%	195950	16.892%
ms	2515386	2090668	83.115%	424718	16.885%
pf	1570408	1305921	83.158%	264487	16.842%
lr	94355	79471	84.226%	14884	15.774%
fo	1795661	1512406	84.226%	283255	15.774%
sz	958590	810154	84.515%	148436	15.485%
ge	3925096	3319865	84.580%	605231	15.420%
aero	1998446	1694635	84.798%	303811	15.202%
gb	83616	70918	84.814%	12698	15.186%
lb	6680371	5681454	85.047%	998917	14.953%
st	5252774	4476529	85.222%	776229	14.778%
tz	2502549	2136492	85.373%	366057	14.627%
cat	4630083	3956699	85.456%	673384	14.544%
gp	590158	504382	85.466%	85776	14.534%
ad	4730925	4059161	85.801%	671764	14.199%
mt	4920568	4227664	85.918%	692904	14.082%

Table 13 - RD bit usage in 2009 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
ws	48080137	33548267	69.776%	14531870	30.224%
cl	47225384	34949020	74.005%	12276364	25.995%
su	19726006	15137919	76.741%	4588087	23.259%
cat	2234803	1715978	76.784%	518825	23.216%
arpa	2968672754	2313870222	77.943%	654802060	22.057%
ua	90104251	71402085	79.244%	18702163	20.756%
mc	1276121	1017338	79.721%	258783	20.279%
coop	1535011	1231576	80.232%	303435	19.768%
mq	75364	61037	80.990%	14327	19.010%
com	4101165027	3366596645	82.089%	734565607	17.911%
gp	189223	156269	82.585%	32954	17.415%
ms	1299516	1078580	82.999%	220936	17.001%
bb	265002	220057	83.040%	44945	16.960%
im	910933	758539	83.271%	152394	16.729%
re	266465	223707	83.954%	42758	16.046%
gi	327618	275623	84.129%	51995	15.871%
lb	3503897	2952350	84.259%	551547	15.741%
gg	562349	475108	84.486%	87241	15.514%
li	1368385	1163297	85.012%	205088	14.988%
sz	340934	289938	85.042%	50996	14.958%
org	815271012	697783751	85.589%	117487142	14.411%
as	1425501	1224455	85.896%	201046	14.104%
cn	300007344	258244015	86.079%	41763266	13.921%
pa	1341844	1155769	86.133%	186075	13.867%
xn--fiqz9s	110	95	86.364%	15	13.636%
it	150085726	129706939	86.422%	20378787	13.578%
ee	9434618	8161353	86.504%	1273265	13.496%
ru	364137467	316201946	86.836%	47930859	13.163%
fk	120732	105554	87.428%	15178	12.572%
aero	967499	851659	88.027%	115840	11.973%
tm	511367	450898	88.175%	60469	11.825%
er	289621	256165	88.448%	33456	11.552%
sm	863569	764374	88.513%	99195	11.487%
mt	2816738	2497632	88.671%	319106	11.329%
st	2906946	2579376	88.731%	327570	11.269%
az	1549236	1381492	89.172%	167744	10.828%
tn	2157772	1924259	89.178%	233513	10.822%
cy	2417014	2156718	89.231%	260296	10.769%
ke	2797476	2499067	89.333%	298409	10.667%
tz	1273432	1140710	89.578%	132722	10.422%

Table 14 - RD bit usage in 2008 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
cn	536176668	154181002	28.756%	381986341	71.243%
ws	20098258	9024652	44.903%	11073415	55.096%
nl	535883181	290459052	54.202%	245423774	45.798%
mz	12145418	8400040	69.162%	3745378	30.838%
arpa	2102941331	1589828353	75.600%	513091764	24.399%
za	43499906	33032458	75.937%	10467421	24.063%
ca	124251389	97022930	78.086%	27227643	21.913%
gg	279801	227087	81.160%	52714	18.840%
org	427976194	350145332	81.814%	77824347	18.184%
dk	78947091	66723025	84.516%	12224008	15.484%
com	2944276167	2504444982	85.061%	439801797	14.938%
de	216321740	185092076	85.563%	31227387	14.436%
so	190101	164370	86.465%	25731	13.535%
su	8217263	7237676	88.079%	979577	11.921%
uk	124292106	109735880	88.289%	14555877	11.711%
pt	58578862	51969846	88.718%	6609000	11.282%
ua	33384728	29626427	88.742%	3756964	11.254%
pn	486661	431918	88.751%	54743	11.249%
ms	605116	537050	88.752%	68066	11.248%
net	1970641113	1757011386	89.159%	213618730	10.840%
tk	10286378	9192668	89.367%	1093706	10.633%
info	72434631	64883534	89.575%	7550316	10.424%
ro	146122882	131466686	89.970%	14656168	10.030%
na	2278683	2056136	90.234%	222525	9.766%
gy	658481	594210	90.240%	64271	9.760%
ht	186171	168189	90.341%	17982	9.659%
it	94915087	86121838	90.736%	8792624	9.264%
ao	2099129	1932693	92.071%	166436	7.929%
asia	62482	57537	92.086%	4945	7.914%
cv	933644	862349	92.364%	71295	7.636%
gov	36465413	33825917	92.762%	2639424	7.238%
cg	82203	76339	92.866%	5864	7.134%
as	664090	617864	93.039%	46226	6.961%
rs	457125	425555	93.094%	31570	6.906%
jp	169180018	157530507	93.114%	11649328	6.886%
ch	42409013	39504725	93.152%	2904065	6.848%
bz	1688564	1572505	93.127%	115600	6.846%
in	23697493	22083078	93.187%	1614061	6.811%
no	19770758	18466608	93.404%	1304117	6.596%
np	2181567	2042021	93.603%	139546	6.397%

Table 15 - RD bit usage in 2007 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
to	4913029	3081246	62.716%	1831782	37.284%
org	374720223	244195332	65.167%	130524737	34.833%
uk	63876907	42554942	66.620%	21321902	33.380%
com	1554984243	1067733719	68.665%	487248568	31.335%
hu	11985340	8319102	69.411%	3666236	30.589%
tv	3430439	2434615	70.971%	995824	29.029%
nu	3349442	2386697	71.257%	962293	28.730%
net	815894848	611704727	74.973%	204158138	25.023%
info	29701900	22312972	75.123%	7388898	24.877%
cx	3719248	2819580	75.810%	899632	24.189%
mp	69460	53424	76.913%	16036	23.087%
ru	57245793	44129553	77.088%	13114849	22.910%
us	39555017	30510674	77.135%	9044288	22.865%
ir	1934639	1494752	77.263%	439887	22.737%
sk	4266659	3302525	77.403%	964134	22.597%
de	89604359	69480863	77.542%	20123376	22.458%
nz	7639747	5936257	77.702%	1703477	22.298%
ca	33426479	26002631	77.791%	7423816	22.209%
be	13908485	10923472	78.538%	2985012	21.462%
it	33100103	26044354	78.684%	7055725	21.316%
mil	14184974	11177829	78.800%	3007145	21.200%
dk	26312856	20909368	79.464%	5403477	20.536%
jp	68830025	55310388	80.358%	13519627	19.642%
no	9357815	7557453	80.761%	1800352	19.239%
cz	20501893	16633735	81.133%	3868157	18.867%
so	411200	334508	81.349%	76692	18.651%
hm	178323	145178	81.413%	33145	18.587%
kr	19844629	16177969	81.523%	3666660	18.477%
ne	203654	166034	81.527%	37620	18.473%
biz	25319183	20718991	81.831%	4600189	18.169%
au	48679445	40005665	82.182%	8673767	17.818%
fr	29887467	24563729	82.187%	5323736	17.813%
ch	17184576	14167805	82.445%	3016750	17.555%
arpa	758820790	626889778	82.614%	131926207	17.386%
is	1662381	1374377	82.675%	288004	17.325%
se	17968603	14869065	82.750%	3099522	17.250%
ec	912452	755243	82.771%	157209	17.229%
br	67851485	56415953	83.146%	11435520	16.854%
edu	67818578	56583207	83.433%	11235217	16.567%
ar	20305206	16979132	83.620%	3326074	16.380%

Table 16 - RD bit usage in 2006 requests to the root for existing gTLDs

TLD	Request Count	RD=0		RD=1	
		Request Count	Request %age	Request Count	Request %age
id	6817734	4598701	67.452%	2219033	32.548%
nc	170171	116624	68.533%	53547	31.467%
org	87328931	70731058	80.994%	16597756	19.006%
to	1851653	1633311	88.208%	218342	11.792%
dk	14118869	12530465	88.750%	1588404	11.250%
com	704747629	642324384	91.142%	62419780	8.857%
cz	6729375	6270720	93.184%	458648	6.816%
gs	394642	370665	93.924%	23977	6.076%
pt	5219216	4915190	94.175%	304026	5.825%
arpa	431804618	407309233	94.327%	24495069	5.673%
net	457764451	432048536	94.382%	25498790	5.570%
jp	27649438	26135019	94.523%	1514419	5.477%
ec	392060	370651	94.539%	21409	5.461%
au	22100638	20982467	94.941%	1117274	5.055%
de	39685645	37828769	95.321%	1856869	4.679%
ru	16470203	15703347	95.344%	758434	4.605%
uk	34827546	33315834	95.659%	1511709	4.341%
mil	6010830	5765233	95.914%	245597	4.086%
lu	749507	719060	95.938%	30447	4.062%
za	5510289	5311730	96.397%	198559	3.603%
cm	517917	499339	96.413%	18578	3.587%
ws	1713487	1654668	96.567%	58816	3.433%
nu	1636799	1582142	96.661%	54657	3.339%
pl	26164576	25294815	96.676%	869761	3.324%
tm	96487	93351	96.750%	3136	3.250%
pk	1404786	1362432	96.985%	42354	3.015%
as	236472	229610	97.098%	6862	2.902%
fr	14848301	14431028	97.190%	417270	2.810%
nl	16533445	16094223	97.343%	439222	2.657%
gov	24825845	24184782	97.418%	641063	2.582%
mq	16766	16334	97.423%	432	2.577%
cx	1332212	1298291	97.454%	33914	2.546%
biz	16075911	15669925	97.475%	405983	2.525%
it	15325651	14948050	97.536%	377595	2.464%
su	1405606	1371729	97.590%	33877	2.410%
ph	1411161	1378286	97.670%	32875	2.330%
nz	3252744	3178146	97.707%	74598	2.293%
info	19401576	18958234	97.715%	443286	2.285%
bf	88396	86389	97.730%	2007	2.270%
at	7652038	7480207	97.754%	171819	2.245%

Table 17 - Top 40 RD=1 counts for current and proposed TLDs in 2006

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
network	465767	14601	com	704747629	62419780
home	15082348	9420	net	457764451	25498790
school	178449	3458	arpa	431804618	24495069
prod	795779	3026	org	87328931	16597756
corp	7621773	2376	id	6817734	2219033
art	63647	2044	de	39685645	1856869
dental	38342	639	dk	14118869	1588404
mail	605263	551	jp	27649438	1514419
hsbc	522369	535	uk	34827546	1511709
google	161691	473	au	22100638	1117274
office	804312	428	pl	26164576	869761
red	203131	343	ru	16470203	758434
csc	47941	274	gov	24825845	641063
goo	54165	262	edu	34248957	582466
site	10976582	251	us	25756565	571382
ltd	156666	211	cz	6729375	458648
host	275230	180	info	19401576	443286
dev	163855	169	nl	16533445	439222
maison	82785	157	fr	14848301	417270
ads	823832	154	biz	16075911	405983
group	235974	142	cn	29253416	388936
auto	61389	130	it	15325651	377595
abc	160158	115	br	40637644	358525
web	139419	113	ca	18080632	317726
exchange	118723	102	pt	5219216	304026
tech	208264	91	mil	6010830	245597
berlin	39009	88	be	13050494	230290
yahoo	116892	87	to	1851653	218342
global	247124	81	tw	22144993	199778
email	116751	75	za	5510289	198559
inc	714160	69	es	13556619	176865
casa	224618	58	at	7652038	171819
blog	5477	57	ar	9680846	170652
farmers	2337	49	se	9543404	165532
cpa	30417	45	ch	8963751	161165
zone	47959	40	mx	7829088	144332
nyc	13031	36	kr	15158371	113335
srl	9808	35	ro	6399901	86486
omega	19361	35	hu	5368754	86256
fujitsu	3071	34	in	4323147	80066

Table 18 - Top 40 RD=1 counts for current and proposed TLDs in 2007

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
home	24002212	308144	com	1554984243	487248568
network	522291	27109	net	815894848	204158138
corp	11252761	19189	arpa	758820790	131926207
live	229759	8458	org	374720223	130524737
legal	19918	8444	uk	63876907	21321902
aol	304407	8276	de	89604359	20123376
airtel	73211	5408	jp	68830025	13519627
xyz	2475039	5173	ru	57245793	13114849
office	898296	5140	br	67851485	11435520
site	8588704	3963	edu	67818578	11235217
academy	26652	3792	us	39555017	9044288
berlin	43186	3098	au	48679445	8673767
ads	1235901	3085	pl	51713939	7949364
inc	1886206	2838	cn	60839960	7487669
mail	796441	2147	ca	33426479	7423816
win	118306	1742	info	29701900	7388898
dev	821386	1659	it	33100103	7055725
google	195745	1607	nl	41060121	6518680
prod	1020923	1379	dk	26312856	5403477
zip	68656	1217	fr	29887467	5323736
box	63524	1200	biz	25319183	4600189
hsbc	980750	1106	tw	36916115	4176839
ltd	171401	1049	cz	20501893	3868157
abc	236655	1045	kr	19844629	3666660
group	568732	1035	hu	11985340	3666236
host	1071519	1007	ar	20305206	3326074
dell	79502	984	es	58780582	3160244
red	274492	952	se	17968603	3099522
free	46689	920	ch	17184576	3016750
web	223032	895	mil	14184974	3007145
tech	98723	858	be	13908485	2985012
gmx	26281	821	at	13784271	2173422
comcast	126387	811	mx	14468798	2031961
active	37483	807	gov	14833532	1965961
casa	396971	794	to	4913029	1831782
global	570272	776	no	9357815	1800352
law	60274	770	za	11800683	1779310
nyc	17871	731	tr	14241532	1719047
yahoo	128731	729	nz	7639747	1703477
art	40208	681	il	10991360	1570729

Table 19 - Top 40 RD=1 counts for current and proposed TLDs in 2008

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
home	104692237	64882	arpa	2102941331	513091764
site	9518913	63906	com	2944276167	439801797
anz	78029	63397	cn	536176668	381986341
mail	2096605	49795	nl	535883181	245423774
corp	36427470	29797	net	1970641113	213618730
network	1369418	23006	org	427976194	77824347
mobi	840500	14462	de	216321740	31227387
xyz	761696	7260	ca	124251389	27227643
google	406953	3848	ro	146122882	14656168
host	9291726	2532	uk	124292106	14555877
studio	91649	1732	dk	78947091	12224008
prod	2701170	1044	jp	169180018	11649328
email	77409	848	ws	20098258	11073415
idn	19082	818	za	43499906	10467421
shop	62615	722	it	94915087	8792624
bet	140515	714	info	72434631	7550316
web	395841	698	ru	158382286	6769311
new	171324	679	pt	58578862	6609000
foo	137251	668	edu	197009457	5266045
group	1219340	613	au	121241107	4795795
ltd	580374	609	br	192556983	3920749
ads	2577582	570	us	97254124	3825221
abc	389601	542	ua	33384728	3756964
skype	649772	533	mz	12145418	3745378
global	1582799	520	il	114162241	3635738
office	2727962	504	fr	71985891	3156507
sina	125669	489	ch	42409013	2904065
red	527890	463	pl	116797225	2717188
gal	13279	460	gov	36465413	2639424
world	640616	456	biz	39542931	2286127
here	176063	456	se	44092761	2119153
cam	138441	440	id	33890041	2065126
you	266358	426	cz	48597214	2054768
win	340282	403	cl	69431785	2042409
zone	150804	337	be	32362362	1993736
msd	115229	291	in	23697493	1614061
inc	1759504	285	es	62945770	1495449
ibm	540327	273	sk	31762964	1306306
bom	117571	260	no	19770758	1304117
family	222578	243	mil	25651182	1219502

Table 20 - Top 40 RD=1 counts for current and proposed TLDs in 2009

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
corp	62187564	58331	com	4101165027	734565607
mail	1499829	36818	arpa	2968672754	654802060
google	723649	29633	net	2832705741	261748241
network	2289069	27197	org	815271012	117487142
home	162280180	20205	ru	364137467	47930859
site	14761329	4970	cn	300007344	41763266
guru	13954	4824	de	305884944	25571674
now	44910	4463	uk	265059516	21091853
host	36651945	3089	it	150085726	20378787
here	266000	2816	info	294906361	18882424
prod	4700189	2202	ua	90104251	18702163
reliance	13555	1856	jp	268291163	18030335
ads	4730970	1711	ws	48080137	14531870
foo	336113	1608	br	301003135	13585876
world	816447	1492	cl	47225384	12276364
xn--55qx5d	2031	1454	au	209094451	10514584
hsbc	2498469	1341	biz	157986615	7837225
xn--io0a7i	1731	1205	us	123112637	7500683
group	2338375	1106	fr	129555030	7419561
web	647591	954	nl	152078674	6515075
global	2968147	803	ca	154187569	6000126
dev	2472637	801	dk	74756222	5430249
office	3509332	788	pl	196788089	5218595
inc	3630794	769	edu	151738826	4917592
studio	189490	766	su	19726006	4588087
cafe	65430	703	es	100083904	4511609
msd	297360	701	se	97876646	4385121
pwc	43448	683	ch	62282163	4257829
shop	74878	668	tw	99852094	4187342
hosting	65187	564	gov	61457962	3748491
yahoo	343923	555	za	43452569	3485159
gal	23152	548	at	98026456	3380721
bet	121635	522	cz	96701760	3334183
goo	178663	508	in	53692667	3123313
stc	32368	470	be	63462879	3115960
ubank	548	447	no	44047771	2970452
red	988826	442	pt	47996232	2461557
win	585949	397	ar	74327193	2318607
tech	434765	378	tr	78323385	2221323
llc	1044902	330	th	30466046	2168016

Table 21 - Top 40 RD=1 counts for current and proposed TLDs in 2010

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
corp	100687659	82282	com	16281653616	7660638370
google	1475699	51347	arpa	3502445234	759276074
mail	1668107	26443	net	6318652097	350682889
home	233286073	24205	org	1077828169	147541641
xyz	260763	20087	ru	537714640	41506184
network	4147179	17466	de	387219534	24700470
here	246501	7410	uk	412315481	24040663
site	21246978	7215	jp	285341622	20699204
host	16900128	3956	cn	338204691	19203105
prod	5263696	3285	br	446567605	16039029
gap	24366	3001	it	231434837	15456712
global	5602018	2326	nl	199858958	14048753
office	4200563	1911	ch	110013951	13946099
box	3118273	1822	us	179753340	12705547
ads	8199959	1787	au	294483746	12118021
studio	197189	1696	pl	317102560	11869312
inc	4849867	1587	in	91253940	10478751
dev	4059949	1350	info	360041801	10472046
paris	98792	1290	fr	191226714	10424916
yahoo	569720	1227	edu	357657572	9620030
web	714116	1202	ca	190970390	9047650
group	4703716	1041	es	159220888	8492833
world	1545060	972	biz	332391638	8357403
plus	154713	953	pt	84216476	8077682
goog	450909	917	dk	98341098	7815412
goo	518248	909	tw	160291415	7618907
hsbc	4855994	890	id	166624453	7432081
bet	214726	772	se	149995794	6974210
new	618482	709	gov	93313793	6860194
bom	127656	685	cz	169151491	6735179
youtube	355198	639	be	90039852	5882981
live	373614	631	at	178307831	5824955
cam	194964	628	tr	118666220	5469582
ltd	1638735	617	no	54976144	5038141
you	429903	608	ua	131212859	5037778
aol	220417	532	za	74319410	4955390
email	61207	527	mx	84567616	4857512
pwc	41705	493	ar	103510435	4834425
gal	45484	492	hu	92597136	4542242
foo	811164	489	ro	146169299	4221828

Table 22 - Top 40 RD=1 counts for current and proposed TLDs in 2011

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
home	311867468	278514	arpa	2326857815	1617043916
corp	113705215	56133	com	7336748012	892990895
google	1404068	26410	net	4528304249	384862113
network	5008800	11174	ru	532428918	159154051
mail	1282825	9486	org	873247098	103293673
office	4239180	5286	biz	384682773	27553086
msd	588075	5072	de	240741287	20138807
studio	217149	4503	uk	212997903	14184774
sina	130542	3722	ws	241020301	13800882
sbi	55894	3661	ua	94402334	13522542
new	525474	3311	cn	308780832	11399781
dev	3690983	2653	ad	13753044	11222756
band	15693	2098	jp	206720929	10343558
college	153630	2009	info	240709745	9818116
site	17902703	1920	nl	132210650	9224071
cisco	2372384	1905	su	30818272	7621575
global	7409742	1861	it	111706245	6712190
xn--55qx5d	17371	1741	br	237197872	5936709
itau	258053	1702	pl	149649515	5534087
host	23151033	1671	fr	101486319	5521611
xn--io0a7i	13091	1642	edu	221871644	5380097
box	5429236	1443	pt	33596182	5282749
world	1391560	1385	us	126801687	4909972
foundation	10397	1382	gov	66794911	4781696
london	112273	1322	tv	50779344	4688975
live	268060	1281	tw	105423981	4467996
online	131308	1254	eu	66299756	4442008
pwc	38261	1034	dk	56032307	4298588
abc	654821	1009	cz	74095344	4232042
here	196885	709	cc	102997650	3942951
youtube	305936	674	au	171044527	3931230
web	691639	645	se	72145526	3902022
are	20878	644	ca	103134652	3834155
wow	397570	621	es	109890209	3797736
aig	5931	578	ar	47195551	3754758
exchange	115769	577	at	95991198	3681133
fox	460517	534	in	60840921	3628387
cab	78552	523	tk	41802766	3146126
gal	57750	493	tr	63272660	2978375
sohu	116569	467	ch	64211281	2948714

Table 23 - Top 40 RD=1 counts for current and proposed TLDs in 2012

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
home	413049544	175467	com	6830303345	932184407
corp	110163266	72483	arpa	840354652	435913325
google	1503142	17891	net	3798836082	408747691
new	639446	16982	org	759472329	100944347
mail	1374011	7979	ru	405781612	91779056
now	100468	7889	cn	284164352	62232684
studio	174830	6537	gov	82050926	22742675
office	3420790	6528	jp	205290471	18858583
svr	134749	5042	uk	225495294	17900984
global	8715904	4835	de	243611245	16745530
network	4031737	4792	nl	130022169	14765827
site	11753489	4052	in	93179142	14203544
dev	3990854	3834	info	204902350	13127629
medical	290672	2148	tw	90424360	12895017
inc	4265296	1813	biz	117164180	11396347
group	5802739	1617	it	90200376	8719586
box	5318539	1499	fr	74961337	8646652
cisco	3840173	1456	ua	62036886	8085730
youtube	719785	1399	rs	20842710	7450838
ltd	1792031	1295	edu	192725625	7216370
taobao	99011	1257	br	211349486	6937868
sina	100844	1066	pl	117559858	6435043
abc	500843	1031	cz	53070690	6243496
itau	238737	1015	au	127188770	6229688
digital	97393	1010	tk	10631397	6009275
sohu	112709	887	us	103173710	5152533
pwc	44537	836	es	54761889	4883316
comcast	552475	798	dk	29533927	4757361
you	464075	741	ca	88954396	4665897
yahoo	440292	726	tv	62170449	4597665
host	2531254	693	se	56225510	4283776
ads	6986098	683	ch	46427077	4095121
web	732326	680	at	76175272	4070069
mnet	1004460	659	su	29702096	3847187
lanxess	276351	582	cc	60017179	3558523
hsbc	3652643	533	be	40023310	3288661
bet	202344	531	gr	31102440	3156996
design	106218	513	fi	24984949	2994369
capital	28915	507	no	21651766	2927289
live	254895	481	eu	64550033	2870709

Table 24 - Top 40 RD=1 counts for current and proposed TLDs in 2013

New TLD	Total Requests	RD=1 Requests	Current TLD	Total Requests	RD=1 Requests
home	862693480	195984	com	6757754131	920763506
google	1655531	69036	net	4035779817	432957140
corp	128338057	64274	arpa	674363221	179576927
sbs	167539	34250	org	874639995	100046835
red	933745	19846	ru	337778423	46488046
studio	172005	9830	cn	318967146	42250835
thd	14669	8870	de	230168256	14003600
office	3588245	8373	in	76777494	12513905
mail	2122865	8047	gov	74242098	12128147
box	6822950	3269	gr	39216273	11468935
dev	4484315	3143	me	69631496	11098879
cisco	7401234	2517	info	195429847	10914841
inc	4604177	1853	jp	206163182	10780980
statefarm	2524	1794	uk	245891975	9816202
ltd	1720410	1709	tw	105973397	9769352
group	7777426	1699	cc	67668186	9085938
chat	47394	1680	us	106670177	6465596
mnet	1425878	1573	br	203534196	6299281
tech	492750	1539	es	61820478	6086565
prod	5934589	1415	fr	84914293	5832401
site	9640792	1333	ua	64874324	5645888
global	11054786	1248	au	127264915	5169855
ads	9251310	1200	edu	188338175	5153729
pwc	51672	1147	it	74181233	4599508
network	7973320	1071	nl	117127684	4493724
comcast	329157	1063	biz	71680161	4341318
new	453818	1058	pt	23974604	4050032
you	480494	841	ca	76230151	3994978
star	2212361	829	pl	120727851	3202334
tvs	65161	814	cz	46933471	3102737
casa	696241	767	mx	36362861	2557557
sina	148018	732	tv	90583508	2402833
youtube	506016	676	se	52082357	2378885
bet	426298	605	co	53413732	2127763
rio	34750	547	eu	87888394	2026748
zone	626435	526	dk	28247720	1930928
svr	105734	511	ar	36250025	1813979
olympus	307688	507	ch	36292634	1632427
live	324573	487	nz	28943357	1611948
medical	330004	466	kr	83917227	1606687