

**DNSSense**

Easiest way to be **secure**

# things of the **internet**

**GLOBAL CYBER DOMAIN REPORT**

**REPORT**

Powered by  
**DNSSense Cyber X-Ray**  
**AI Platform**

# things of the internet

**DNSSense** is a DNS Layer Security Platform focused on actively protecting all devices in the network against any malicious activity, including Phishing, Ransomware, and Zero-day attacks.

**DNSSense**'s threat database updates itself 24/7 by crawling the entire internet and categorizing the whole internet's domains by using its own AI with immense accuracy. Many Firewall vendors around the world benefit DNSSense's threat database.

Today, **DNSSense** receives the DNS traffic of more than 10.000+ companies from 74 countries each day.

## Data from **Cyber X-Ray®** Platform

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As **DNSSense** team, we are pleased to release this edition of our Cyber Threat Intelligence Report. All data is from the **Cyber X-Ray®** platform and is current (as of May 2022).

**Cyber X-Ray®** is an AI-powered platform that provides detailed analysis for websites in all forms and contents. It continuously scans internet assets' (domain, IP, FQDN, SSL certificates, web pages, etc.) security futures, content, popularity, blacklisting information, in-links and out-links data for scoring. You may find more about it at the end of this report.

## Foreword

Understanding the internet is essential. In our opinion, one of the best ways to understand the internet is undoubtedly via DNS protocol. As **DNSSense**, we have very detailed, historical, and relational records of about **506,322,733** domains in our database. In other words, we have the entire internet data! The statistics from our records are as follows.

Enjoy!

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## Key Findings

- The total number of domains in the world is **506,322,733** (Including dead sites).
- The total number of FQDNs in the world is **1,228,820,448**.
- The total number of down domains in the world is **257,157,154**.
- The total number of up domains in the world is **249,165,579**.
- The number of newly registered or first-seen domains in 2021 is **61,455,161**.
- About 40% of domains with valid SSL from domains with HTTP status 200 use free SSL.
- More than 5 billion DNS A record changes were made in 2021.
- More than 13 million 'paid link building' (backlink) services were purchased in 2021.
- The total number of paid backlinks exceeds 93 million.
- During the pandemic, up to 2,000 malicious websites were created daily with the Covid-19 theme.
- The most secure TLD (Top level domain) on the web is ' .gov'. This

domain was developed for government agencies and is the only top-level domain free of dangerous websites.

- The worst places to download files are ':tk' (Tokelau), ':ws' (Samoa), ':bg' (Bulgaria) and ':biz' (Registry Services, LLC). If you visit these domains or download files from them, you deal with a potentially dangerous website one of ten times.
- After .gov, the most secure domains are the Scandinavian domains. The list goes as follows;
  - 1) ':fi' (Finland),
  - 2) ':no' (Norway),
  - 3) ':se' (Sweden),
  - 4) ':is' (Iceland),
  - 5) ':ie' (Ireland).
- In 2021, an average of 100,000 malicious domains were discovered per day.
- Over 80% of malware use DNS to communicate with command-and-control (C&C) servers, exfiltrate data or redirect traffic to malicious sites.

# Total Number of Domains Worldwide

Not long ago, people would come across with only a few 'Top-Level Domains' such as '.com, .org, .info, .net! But nowadays, the number of top-level domains has increased dramatically due to the maintenance of domains being a profitable business despite the huge competition.

As of December 2021, IANA (Internet Assigned Numbers Authority) root domain contains over 1500 top-level domains.

As of December 2021, according to the Cyber X-Ray database,

The total number of domains in the world is **506,322,733** (Including dead sites).

The total number of FQDNs in the world is **1,228,820,448**.

The number of newly registered or first-seen domains in 2021 is **61,455,161**

The monthly average number of newly registered domains in 2021 is **5,121,263**

The daily average number of newly registered domains in 2021 is **170,000**

The number of newly registered or first-seen domains in 2020 is **79,629,933**.

# Tracking 'Down Domains' for Security

By the end of 2021, the total number of domains registered worldwide has surpassed 570 million, with over 315 million dead sites. So why track these 'down domains' in terms of cyber security?

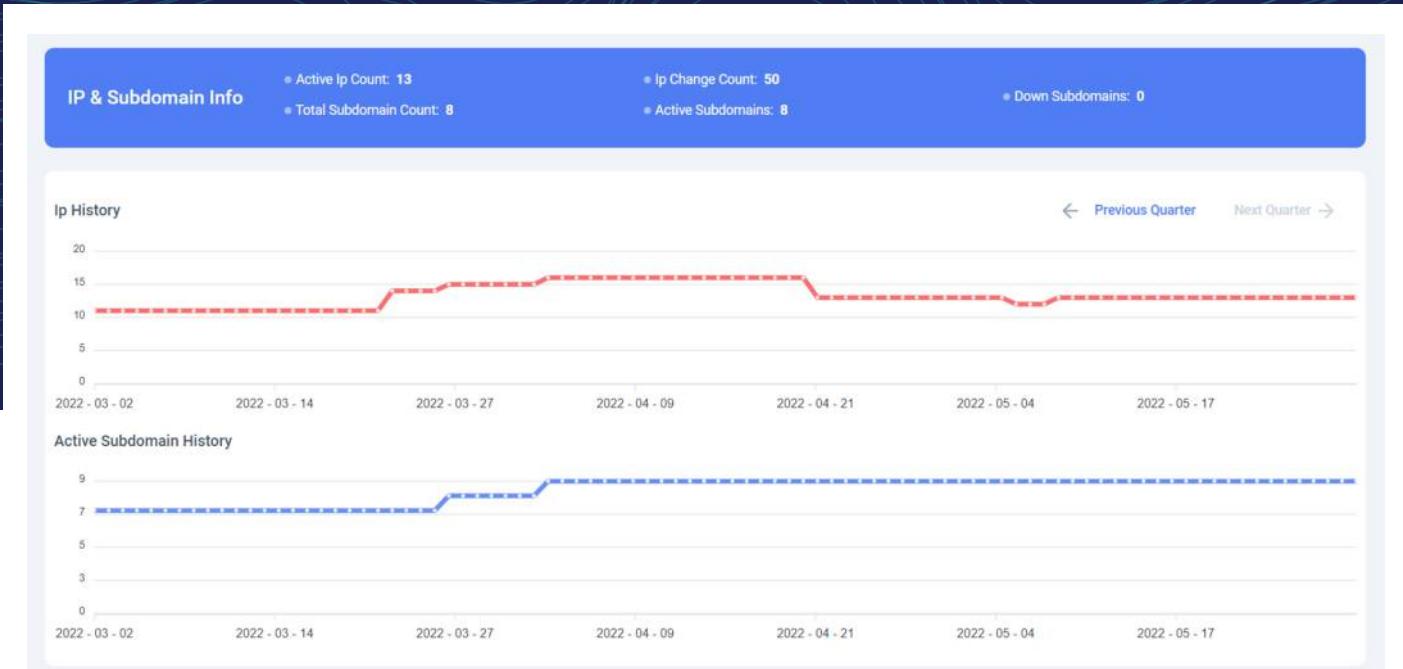
There are 79 million malware domains in the Cyber X-Ray database. Approximately 85% of these domains do not have an IP address. Below is an example of a malicious traffic report found in a passive state.

## Tracking 'Down Domains' for Security

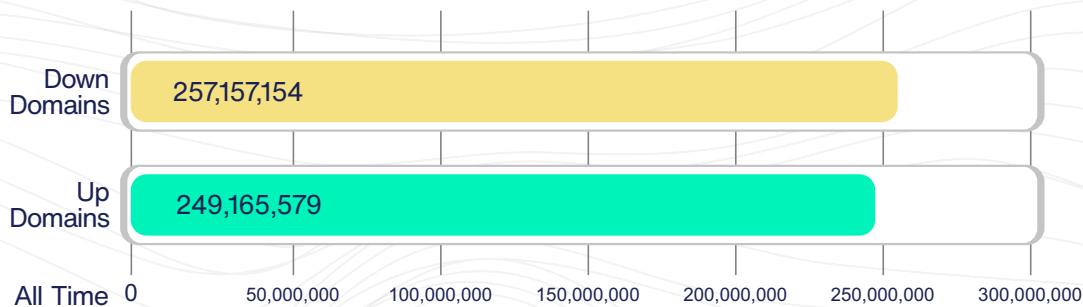
When requesting domains that do not have IP addresses, the destination IP is recorded as 0.0.0.0 in DNS logs. Seeing high volumes of domain queries without destination IP addresses in the DNS logs is usually considered a malicious activity. It could mean that one or more infected devices are trying to connect a botnet C&C (Command and Control) server from the network.

Historical data on whether a domain has been associated with a specific DNS record at some point is also very beneficial. It is considered that domains used in cybercrime are taken down once their function is completed.

# IP Graph:



## Total Up & Down Domains

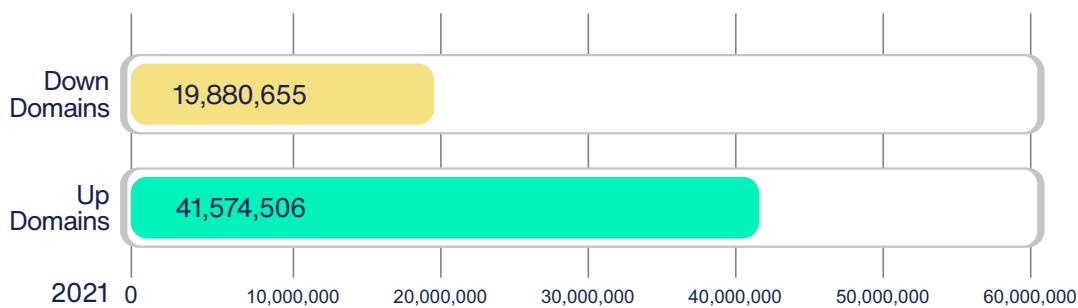


As of December 2021, according to the Cyber X-Ray database,

The total number of down domains in the world is **257,157,154**

The total number of up domains in the world is **249,165,579**

## 2021 Up & Down domains



*Almost 50% of domains registered in 2021 were never put into service or not renewed after being used for a set period.*

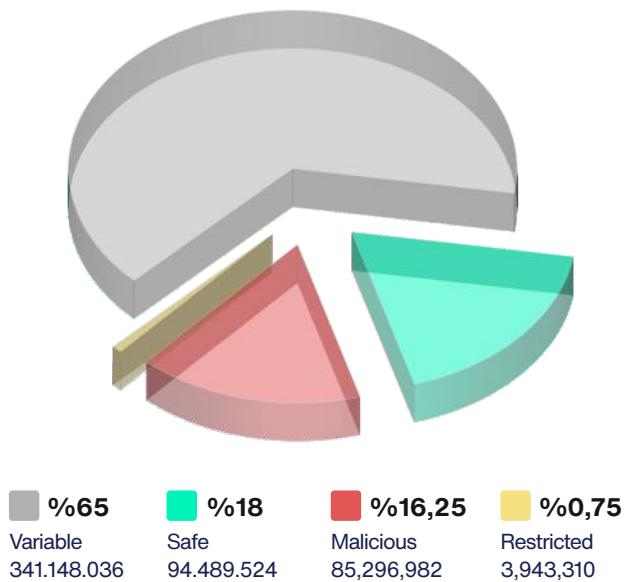
The number of newly registered or first-seen **down** domains in 2021 is **19,880,655**

The number of newly registered or first-seen **up** domains in 2021 is **41,574,506**

# Categorising the Whole Internet

Cyber X-Ray categorises all internet domains into four key groups based on their security and then their content.

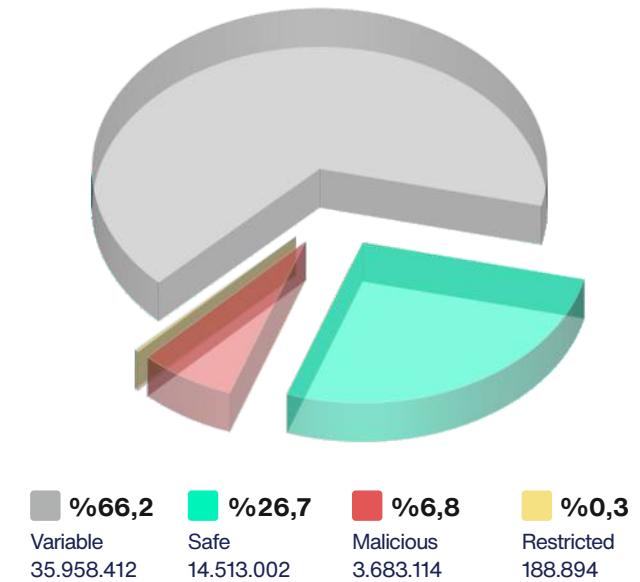
## Distribution of Domain Categories



These categories are:

- Safe
- Malicious
- Variable
- Restricted Content (Safe)

## 2021 Distribution of Domain Categories



## Safe Domains

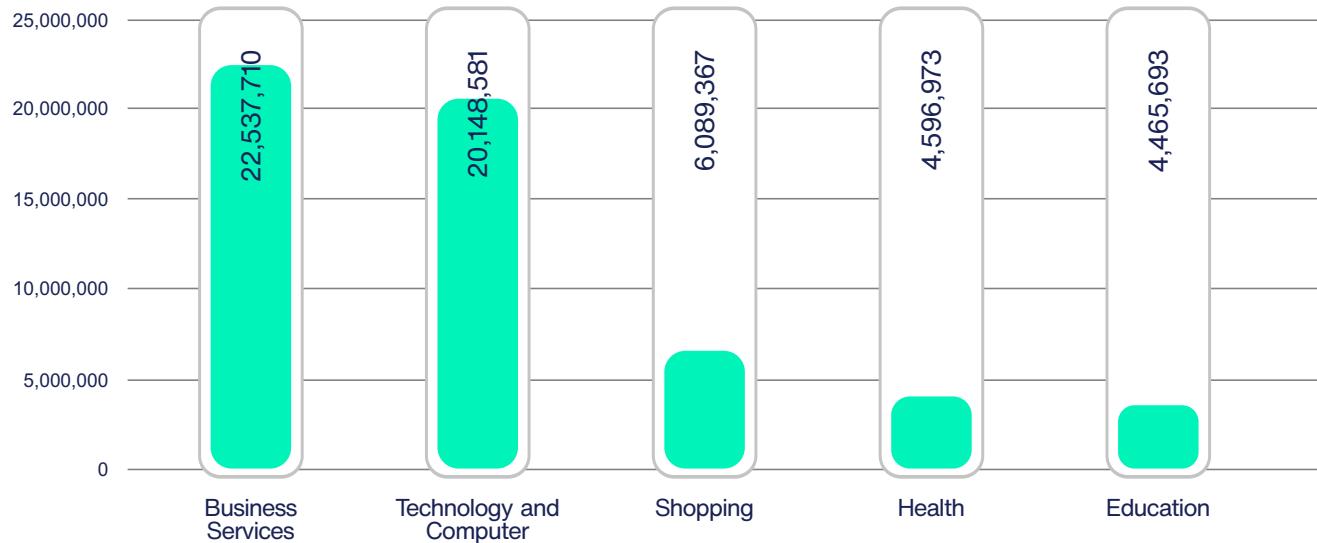


The Safe categories are those domains do not pose a security threat. Their content is not offensive (appropriate for the general public). Domains contents including;

*webmail, weapon and military, vehicles, vacation and travel, technology and computer, sports, software downloads, society, social networks, shopping, search engines, religion-related, real estate, reference, online storage, online video, news, music, kids, job search, infrastructure services, health, government and organization, forums, financial services, entertainment, education, cooking, content delivery networks (CDN), clothing and fashion, chat, business services, blogs, arts and culture, and advertisements*

belongs to the safe category.

# Top 5 Safe Domain Categories

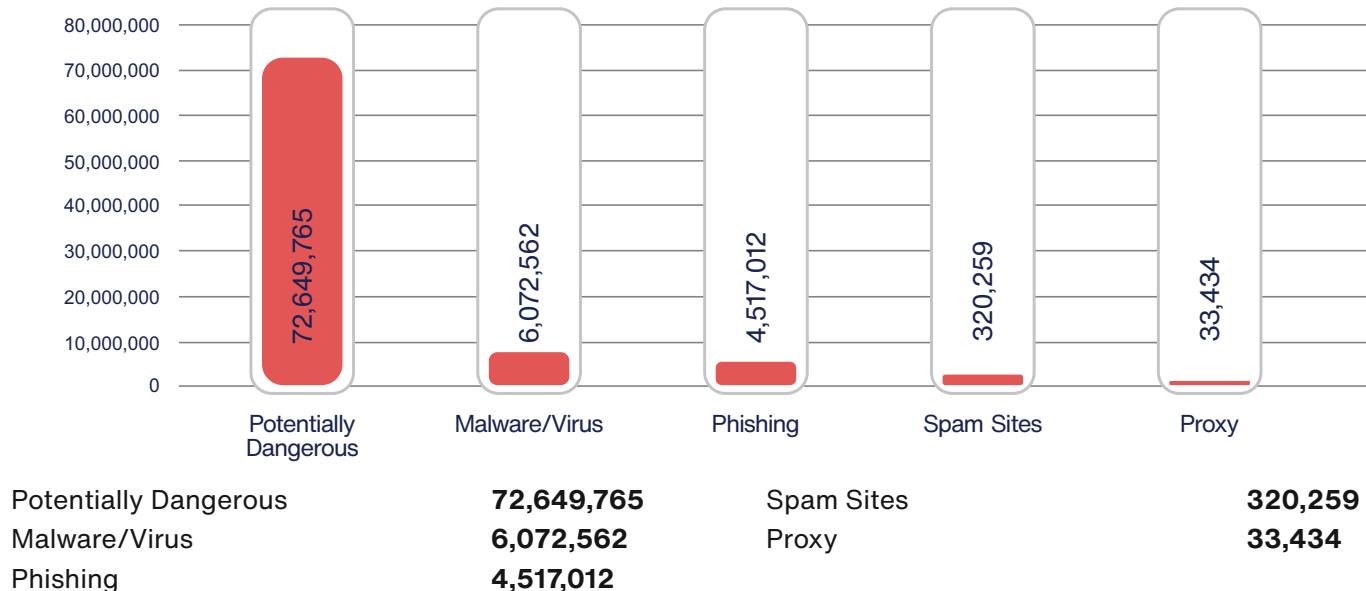


Business Services	<b>22,537,710</b>	Health	<b>4,596,973</b>
Technology and Computer	<b>20,148,581</b>	Education	<b>4,465,693</b>
Shopping	<b>6,089,367</b>		

According to Cyber X-Ray, there are **94,489,524** safe domains on the internet. Generally speaking, 'Safe Domains' are domains that have been up for a long time, and their category hardly changes. There is only a 5% chance of a safe domain switching to a non-safe category, which is relatively modest.

# Malicious Domains

## Top 5 Malicious Domain Categories



According to Cyber X-Ray, regardless of their content, Domains in the Malicious categories pose a threat to network security.

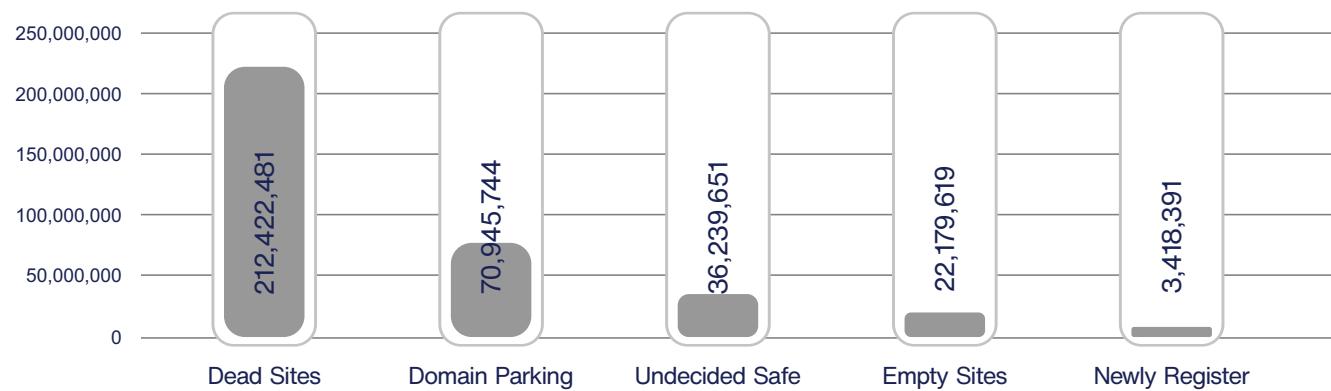
According to CyberX-Ray, there are **85,296,982** malicious domains on the internet.

As the graph shows, 75% of malicious domains belong to the 'Potentially Dangerous' category globally.

Other malicious domain categories are;  
Bad-IP, Black Listed, Botnet CC, DGA Domain, Hacking, Malware/Virus, Phishing, Proxy, Spam Sites, Warez.

# Variable Domains

## Top 5 Variable Domain Categories



Dead Sites **212,422,481**

Domain Parking **70,945,744**

Undecided Safe **36,239,651**

Empty Sites **22,179,619**

**22,179,619**

**3,418,391**

According to Cyber X-Ray, the Variable categories are the vast majority of domains, such as 'dead-sites' (domains that have been down for more than three months) and "domain-parking"<sup>1</sup> belong to this category.

According to Cyber X-Ray, there are **341,148,036** variable domains on the internet.

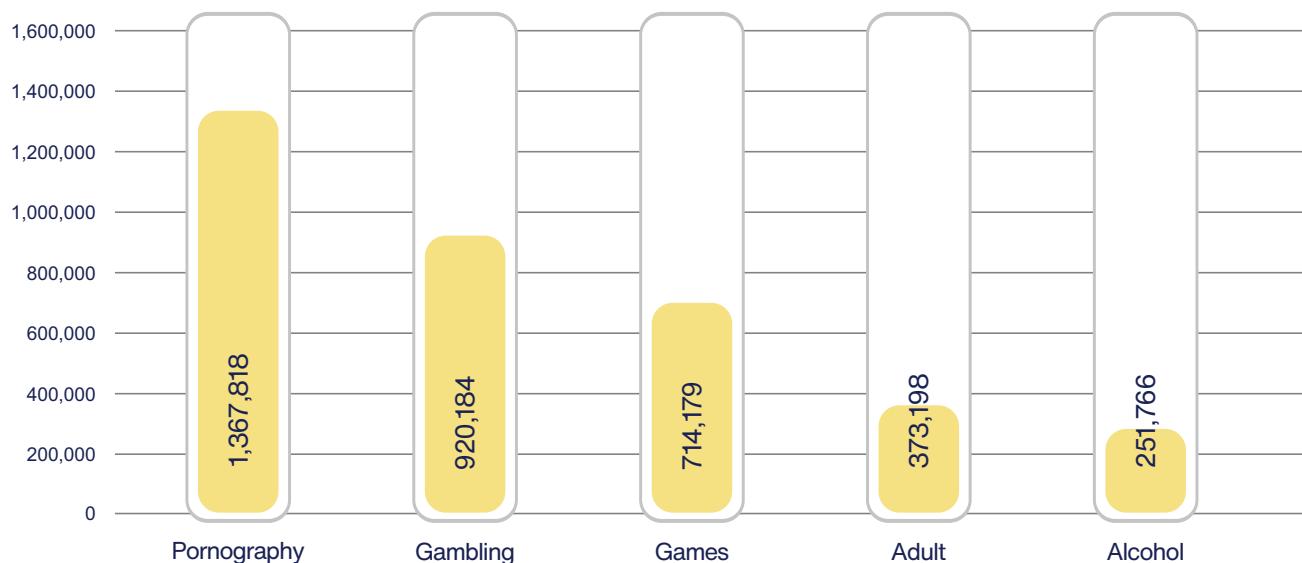
The Variable domains also includes first-seen, NX, newly registered, newly up, undecided not safe, undecided safe, and unknown domains, along with dynamic DNS traffic and malformed queries.

The most significant feature of this category is that domains in this group can change characteristics in terms of security. Domains switch between categories the most in the variable domains.

<sup>1</sup> Domain parking is registering an Internet domain name without that domain being associated with any services such as e-mail or a website. This may have been done to reserve the domain name for future development and to protect against the possibility of cybersquatting.

# Restricted Content (Safe) Domains

## Top 5 Restricted Domain Categories



Pornography

Gambling

Games

**1,367,818**

**920,184**

**714,179**

Adult

Alcohol

**373,198**

**251,766**

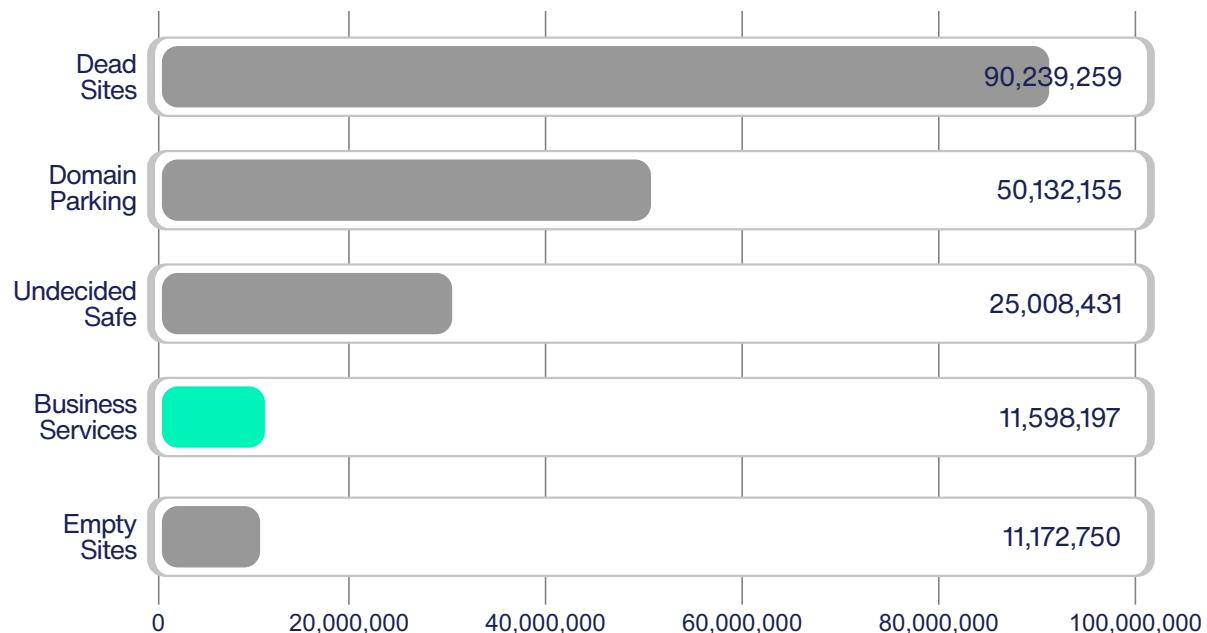
According to Cyber X-Ray, Restricted (Restricted content) means secure domains that contain potentially offensive content such as alcohol, gambling, pornography, and drugs.

According to Cyber X-Ray, there are **3,943,310** domains on the internet in the Restricted domains.

# Top 5 Domain Categories on the Internet

As Variable domains contains the vast majority of the internet, it clearly dominates the charts.

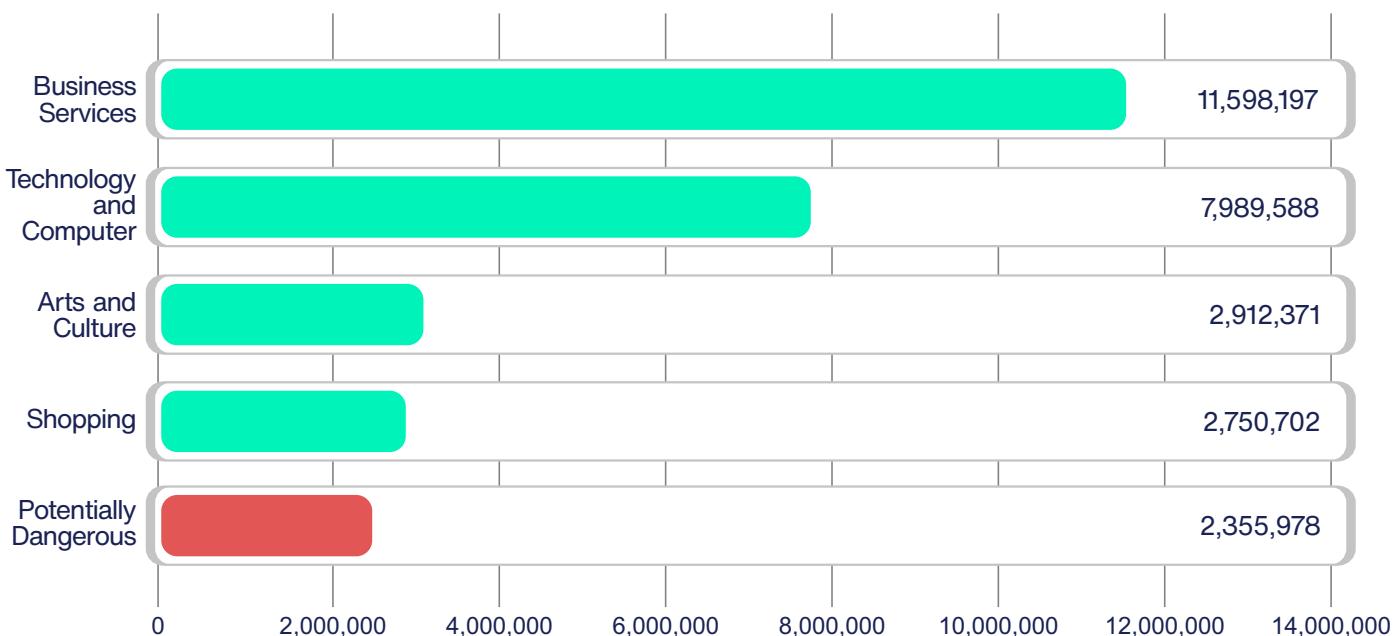
## Top 5 Domain Categories With the Variable Domains



Dead Sites	<b>90,239,259</b>	Business Services	<b>11,598,197</b>
Domain Parking	<b>50,132,155</b>	Empty Sites	<b>11,172,750</b>
Undecided Safe	<b>25,008,431</b>		

# Top 5 Domain Categories on the Internet

## Top 5 Domain Categories Without the Variable Domains

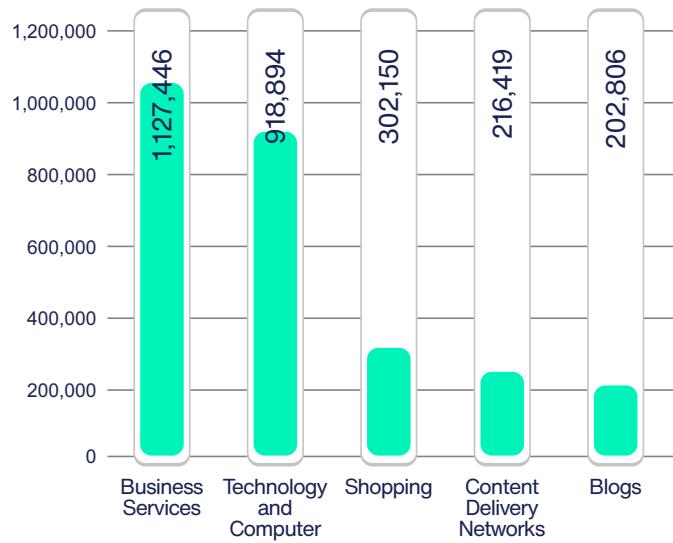


Business Services	<b>11,598,197</b>
Technology and Computer	<b>7,989,588</b>
Arts and Culture	<b>2,912,371</b>

Shopping	<b>2,750,702</b>
Potentially Dangerous	<b>2,355,978</b>

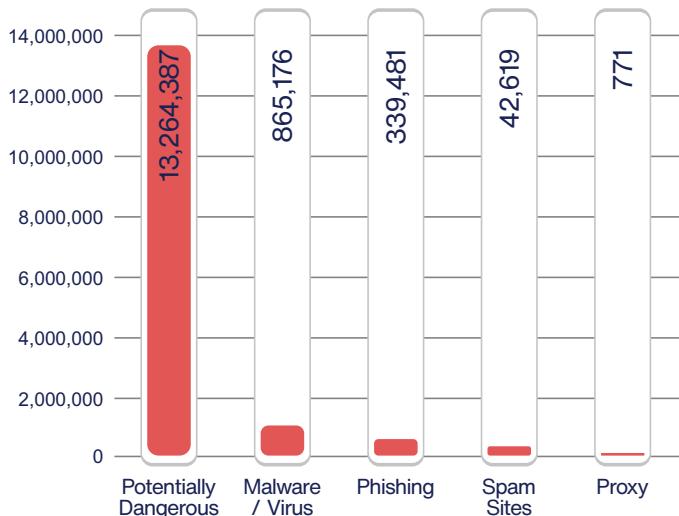
# Categories of Newly Registered Domains in 2021

## 2021 Top 5 Safe Domain Categories



Business Services	<b>1,127,446</b>
Technology and Computer	<b>918,894</b>
Shopping	<b>302,150</b>
Content Delivery Networks (CDN)	<b>216,419</b>
Blogs	<b>202,806</b>

## 2021 Top 5 Malicious Domain Categories



Potentially Dangerous	<b>13,264,387</b>
Malware/Virus	<b>865,176</b>
Phishing	<b>339,481</b>
Spam Sites	<b>42,619</b>
Proxy	<b>771</b>

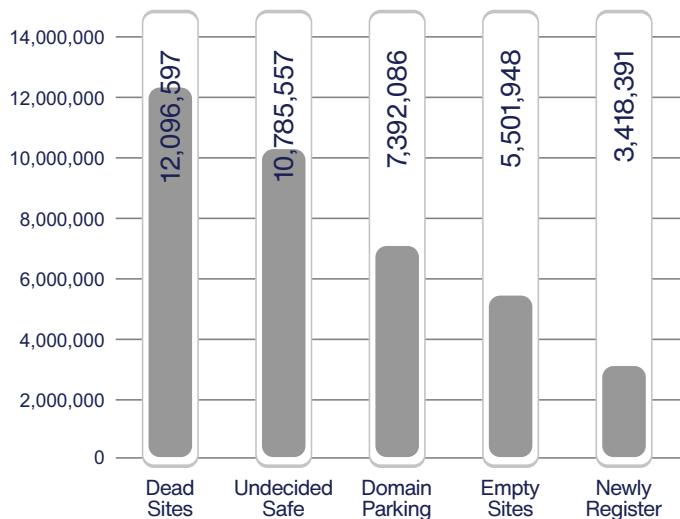
## Top 5 Safe Categories for Domains Registered in 2021

Websites have increased, particularly in "Business Services" and "Technology and Computers" in 2021, which is higher than the average of previous years.

## Top 5 Malicious Categories for Domains Registered in 2021

# Categories of Newly Registered Domains in 2021

## 2021 Top 5 Variable Domain Categories

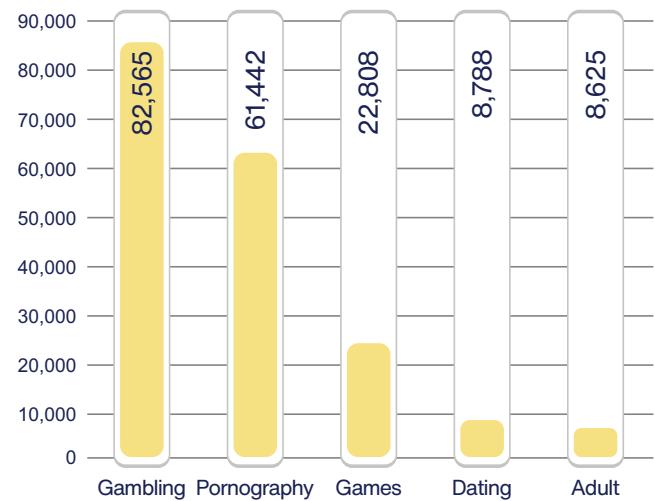


Dead Sites	<b>12,096,597</b>
Undecided Safe	<b>10,785,557</b>
Domain Parking	<b>7,392,086</b>
Empty Sites	<b>5,501,948</b>
Newly Register	<b>3,418,391</b>

Top 5 Variable Categories for Domains Registered in 2021

The number of dead sites increased by 37% over the previous year, as did the number of domain parking.

## 2021 Top 5 Restricted Categories



Gambling	<b>82,565</b>
Pornography	<b>61,442</b>
Games	<b>22,808</b>
Dating	<b>8,788</b>
Adult	<b>8,625</b>

Top 5 Restricted Categories for Domains Registered in 2021

Almost half of the restricted domains are in the 'Gambling' category.

# Domain Popularity

Popularity on the internet can be calculated in a variety of ways. Nonetheless, this report is calculated using in-link/out-link (Internal Linking<sup>2</sup>) relationship between domains.

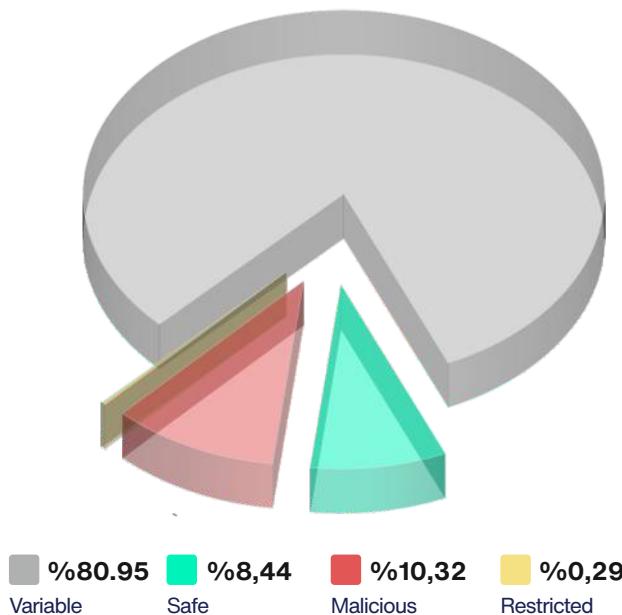
According to Cyber X-Ray, the popularity of a domain grows as more websites contain (outlink) the domain's address. The more referring links found on other web pages to a given domain, the more popularity that domain will have for Cyber X-Ray.

	<b>Variable</b>	<b>Safe</b>	<b>Malicious</b>	<b>Restricted</b>
Has no inlink (there are no webpages referring these domains)	285,756,544	29,783,954	36,438,327	1,033,271
Has inlink from malicious domains	1,746,015	3,602,126	606,856	264,376
Has inlink from safe domains	37,788,104	38,905,902	2,748,262	1,220,605
Has inlink from variable domains	13,474,767	18,123,888	1,003,255	672,238
Has inlink from restricted domains	2,375,815	4,071,791	280,313	752,728

<sup>2</sup> Internal linking, links between pages on a single website, is also a core component of how search engines discover and rank a website's content.

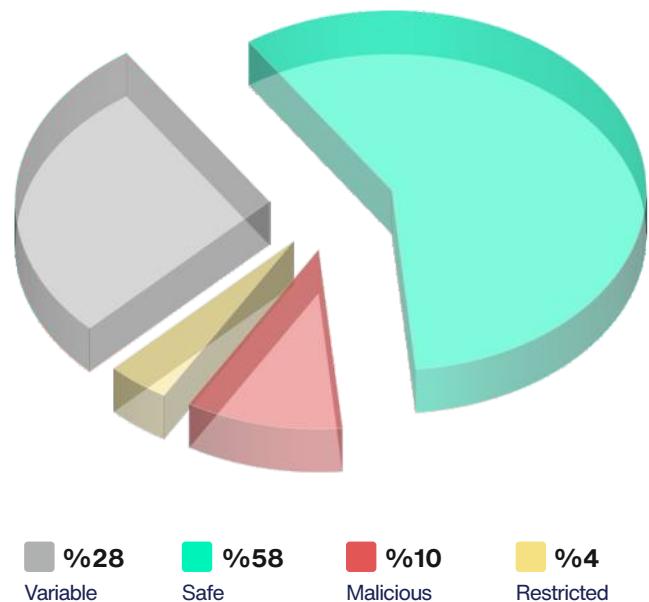
# Domain Popularity

**Has no inlink**



Most domains that do not have inlinks fall into the 'Variable' category.

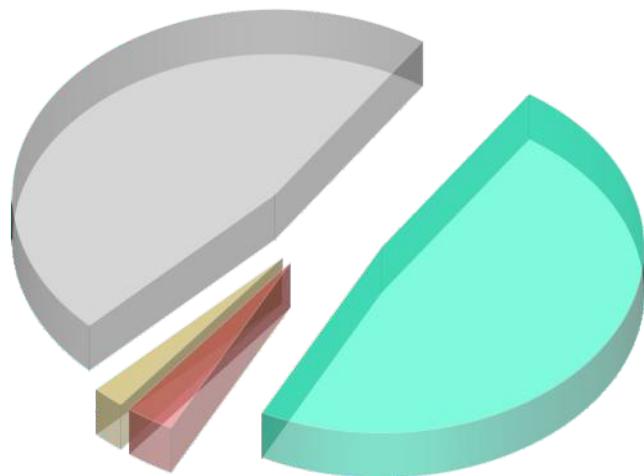
**Has inlink from malicious domains**



It turns out that more than half of those who have inlinks from malicious domains fall into the 'Safe' category, with the remaining majority falling into the 'Variable' category.

# Domain Popularity

**Has inlink from safe domains**

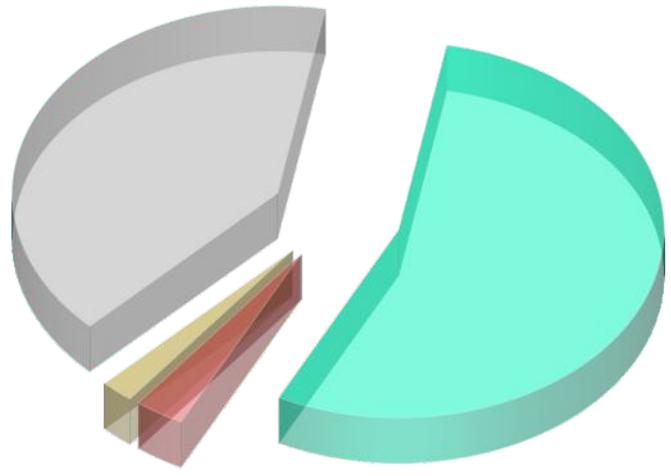


Variable %47  
Safe %48  
Malicious %3  
Restricted %2

Domains inlinks from the 'Safe' category mainly belong to the 'Variable' and 'Safe' categories.

In other words, the vast majority of secure webpages on the internet send traffic to less secure webpages.

**Has inlink from variable domains**

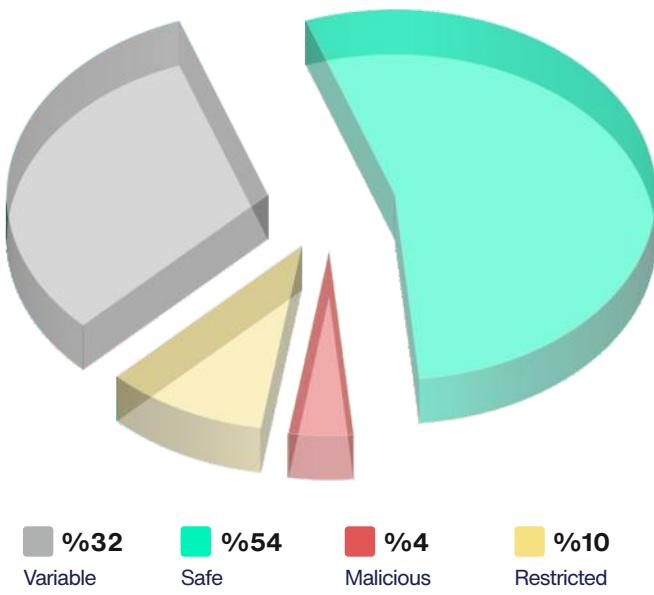


Variable %40  
Safe %54  
Malicious %3  
Restricted %2

Domains inlinks from the 'Variable' category mainly belong to the 'Variable' and 'Safe' categories.

# Domain Popularity

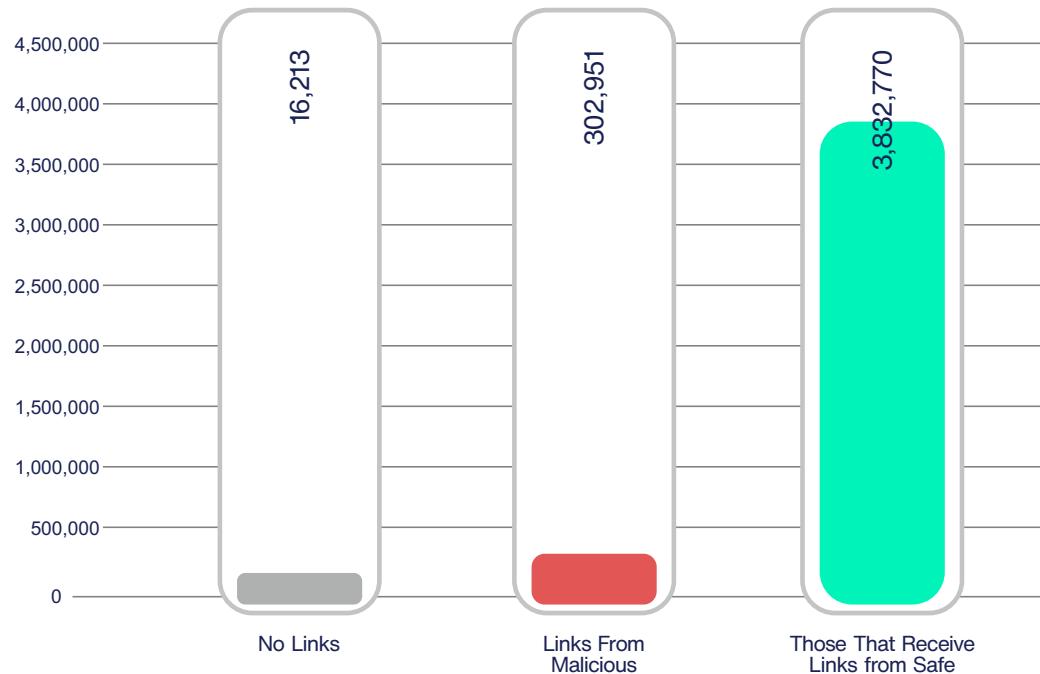
## Has inlink from restricted domains



Most of those inlinks from domains in the 'Restricted' category belong to the 'Safe' and 'Variable' categories.

# Malicious Domains in Top-ranking

## Has inlink from restricted domains



Popularity can be calculated in many different ways on the Internet, but in this report it is calculated using the in-link/out-link relationship of a domain that is different from other domains.

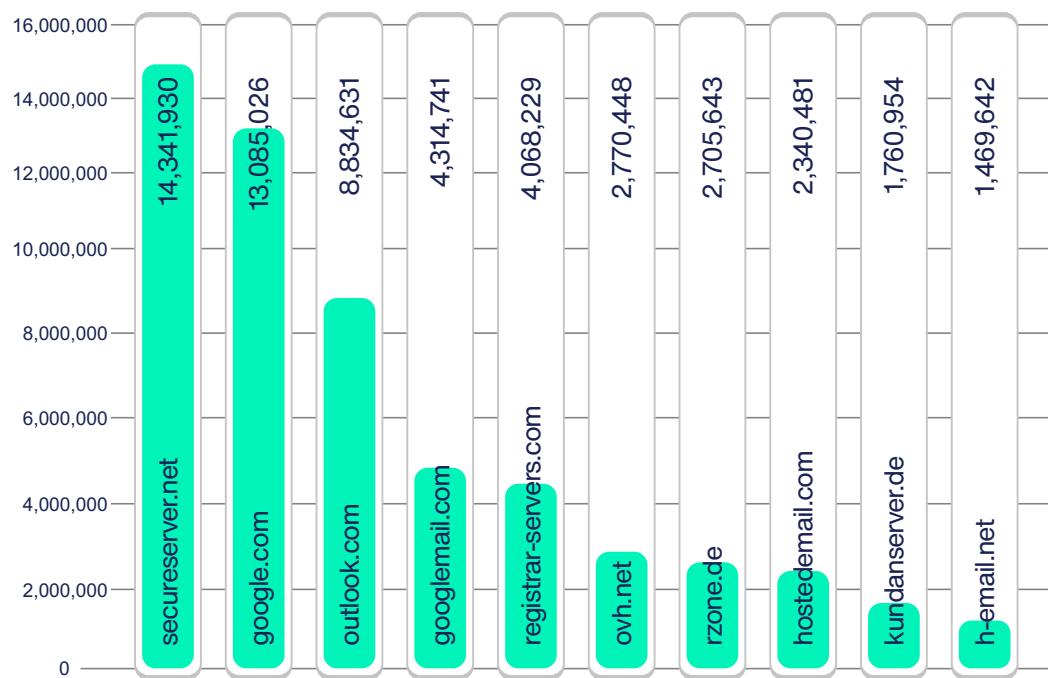
# Top MX Domains on the Internet

MX

MX records, or Mail Exchange records, is a DNS records direct e-mail to a mail server. MX record must always point to another domain.

Here is the list of most popular top 10 MX domains in the world as of December 2021 (by registered domains),

## Top 10 MX domains (by registered domains)



secureserver.net	<b>14,341,930</b>	rzone.de	<b>2,705,643</b>
google.com	<b>13,085,026</b>	hostedemail.com	<b>2,340,481</b>
outlook.com	<b>8,834,631</b>	kundenserver.de	<b>1,760,954</b>
googlemail.com	<b>4,314,741</b>	h-email.net	<b>1,469,642</b>
registrar-servers.com	<b>4,068,229</b>		
ovh.net	<b>2,770,448</b>		

# Top NS Domains on the Internet

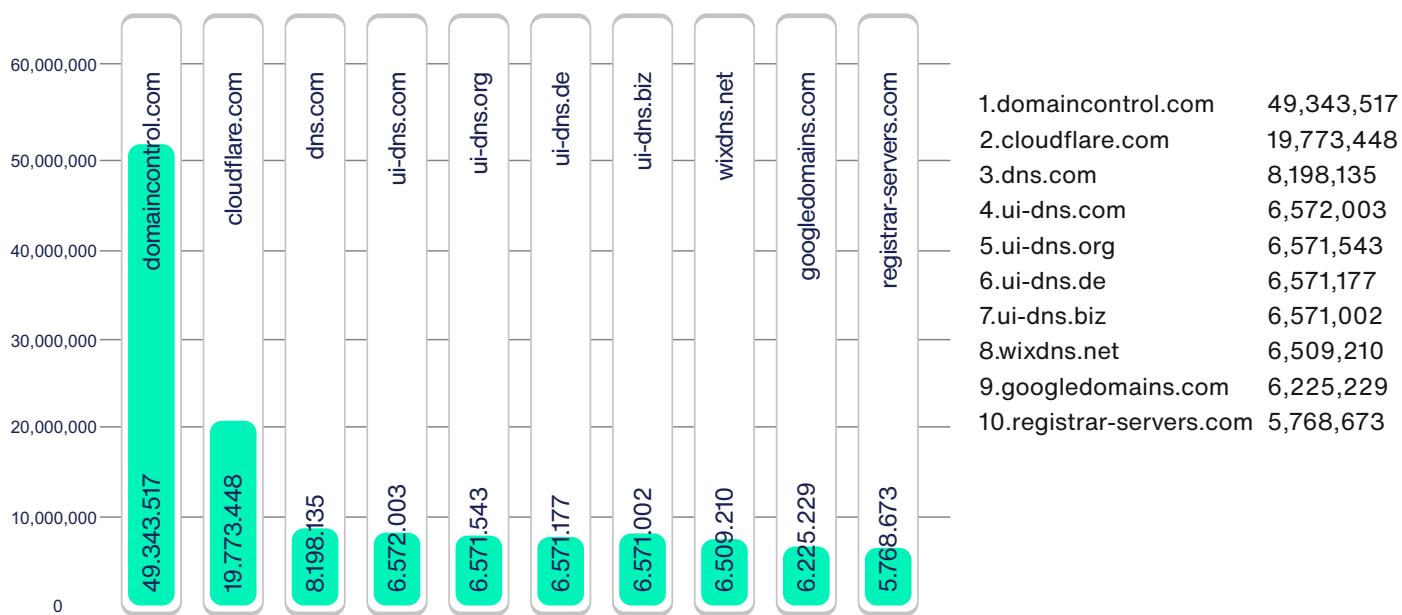
# NS

NS stands for 'nameserver.' The nameserver record indicates which DNS server is authoritative for that domain (i.e. which server contains the actual DNS records). NS records tell the Internet the IP address of the domain.

A domain often has multiple NS records, indicating primary and secondary nameservers. Users will be unable to access a website or application if NS records are not correctly configured.

Here is the list of most popular top 10 NS domains in the world as of 2021 (by registered domains),

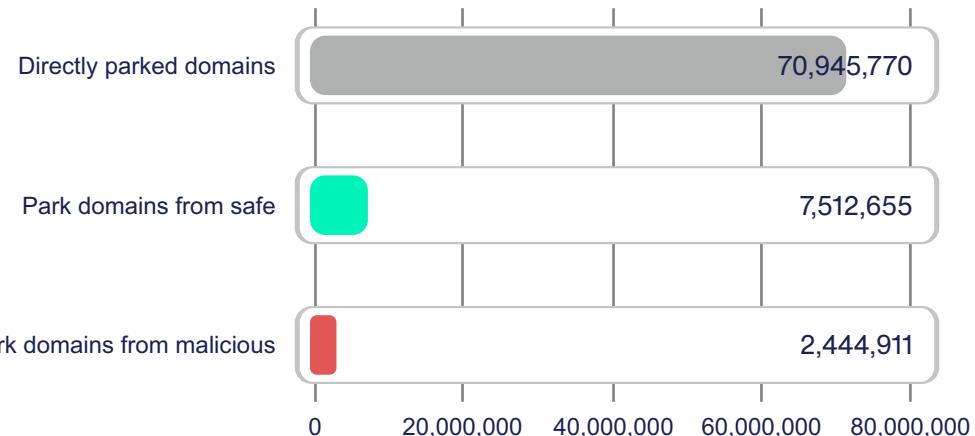
## Top 10 NS domains (by registered domains)



# Parked Domains



## Parked Domains



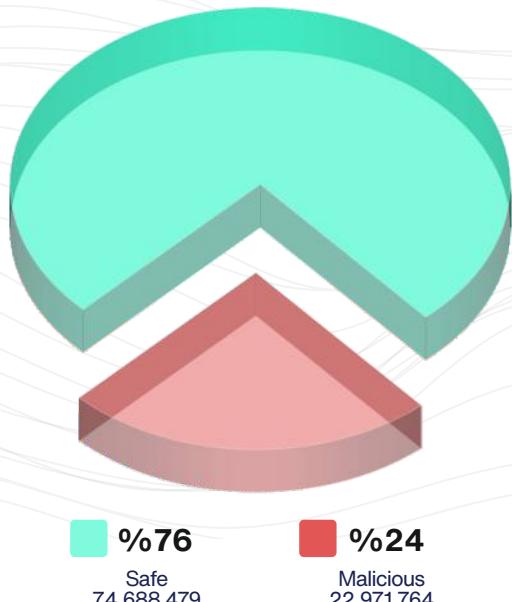
Park domains from malicious	<b>2,444,911</b>	Directly parked domains	<b>70,945,770</b>
Park domains from safe	<b>7,512,655</b>		

The fact that parked domains are not associated with any online service, website or e-mail hosting raises suspicion regarding security.

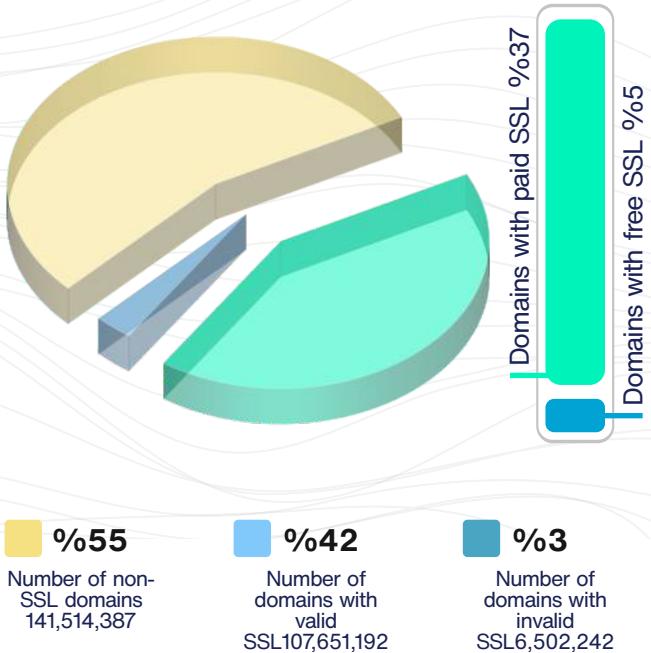
Domains parked from the 'Safe' category are examples of when a secure website is closed and not renewed.

On the other hand, domains parked from the 'Malicious' category are cases where a malicious domain is closed and not re-registered.

## Domains With HTTP Status 200



## HTTP 200 Status OK with SSL



There are **94,489,524** safe domains on the internet, and 79% of them have the HTTP 200 status.

In opposition, 27% of the malicious domains have HTTP 200 status out of **85,296,982**.

This indicates that many malicious or safe domains still accept HTTP requests.

Number of domains with valid SSL  
**107,651,192**

Number of non-SSL domains  
**141,514,387**

Number of domains with invalid SSL  
**6,502,242**

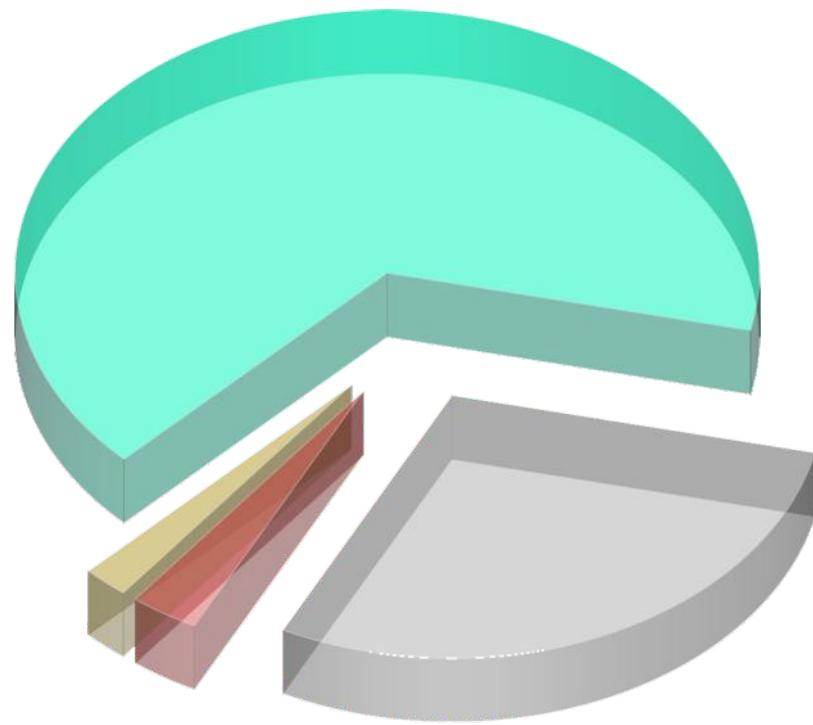
About **5%** of all domains use free SSL services.

Domains with free SSL  
**12,290,313**

Domains with paid SSL  
**95,360,879**

# Category Distribution of Domains with SSL Certificate

## Category Distribution of Domains with SSL



■ %66

Safe  
44,021,226

■ %29

Variable  
19,485,590

■ %3

Malicious  
1,981,855

■ %2

Restricted  
1,255,396

# Languages Used on the Internet



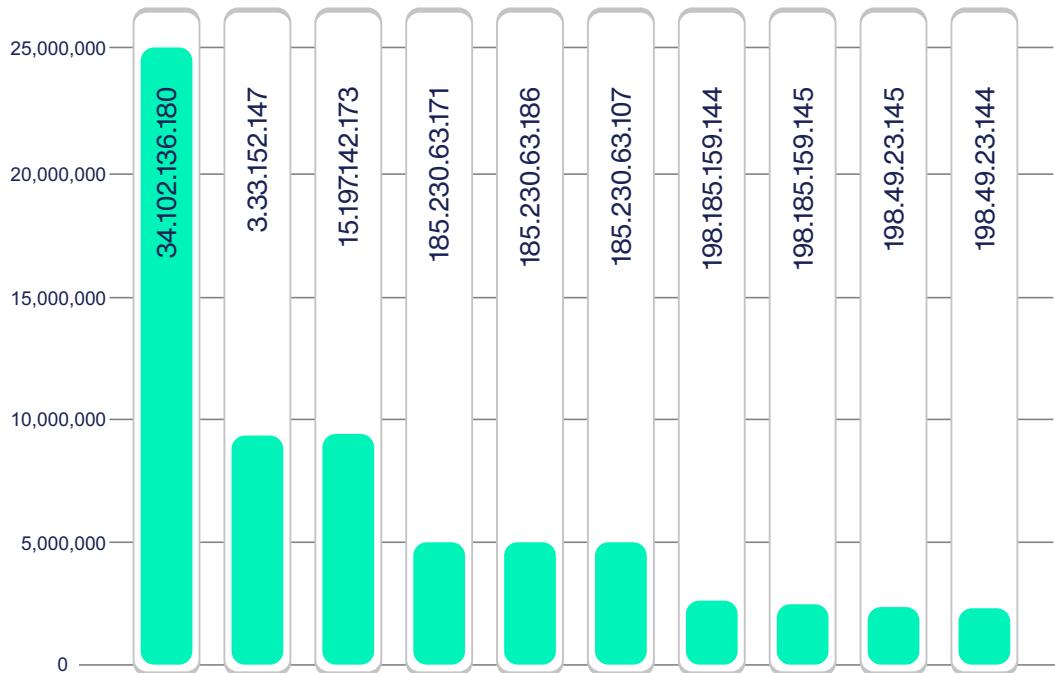
## Languages Used on the Internet



The top ten most popular internet languages make up 95% of all internet domains. While English is the most popular language on the internet, other languages share only 4%, excluding the first ten languages.

# Popular IPs on the Internet

## Top 10 Most Popular IP Addresses (by the number of domains using them)



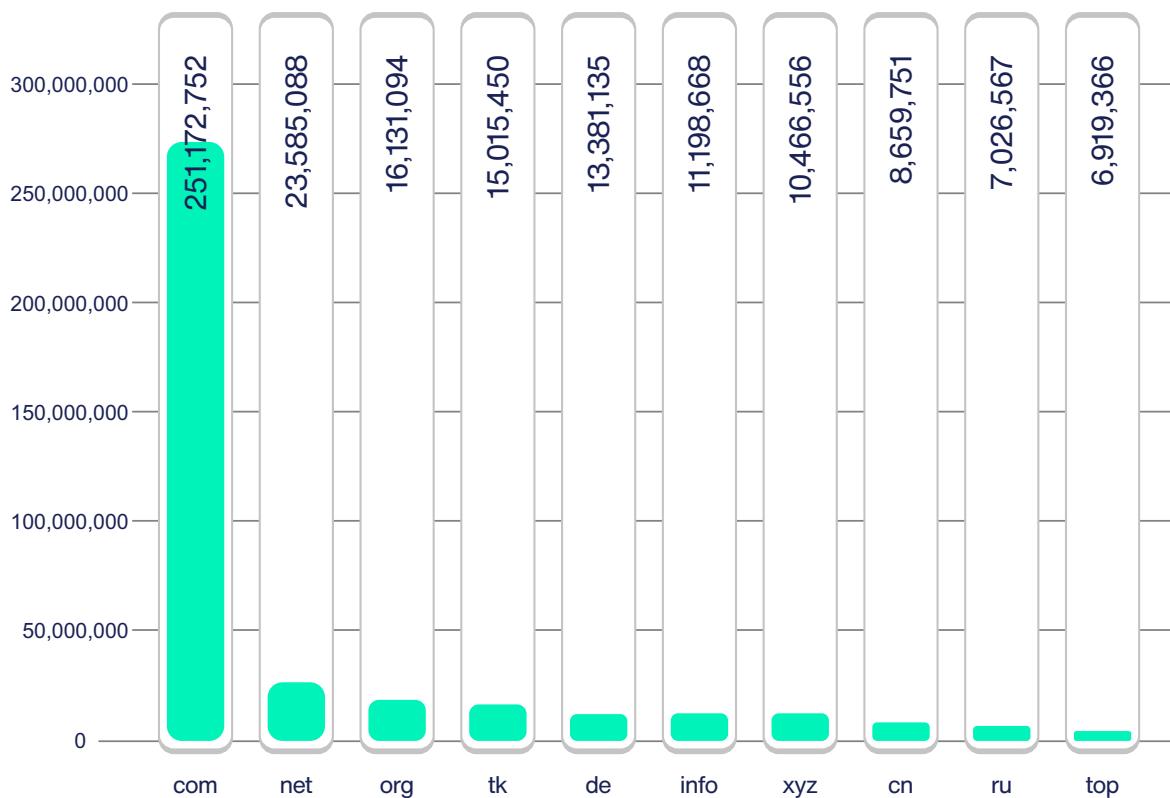
Millions of domains are hosted on the same IP addresses on the internet. Above 25 million domains are using a single IP address (34.102.136.180).

Here is the list of most popular top 10 IP addresses in the world as of 2021 (by the number of domains using them),

1. 34.102.136.180	<b>22,904,993</b>	5. 182.61.201.92	<b>10,510,717</b>	9. 198.185.159.144	<b>7,190,559</b>
2. 182.61.201.90	<b>10,511,117</b>	6. 3.33.152.147	<b>10,236,737</b>	10. 198.185.159.145	<b>7,103,263</b>
3. 182.61.201.91	<b>10,511,115</b>	7. 15.197.142.173	<b>10,233,808</b>		
4. 182.61.201.50	<b>10,510,717</b>	8. 199.59.243.200	<b>8,349,058</b>		

# Most Used Top 10 TLDs Worldwide

## Top 10 TLDs Worldwide

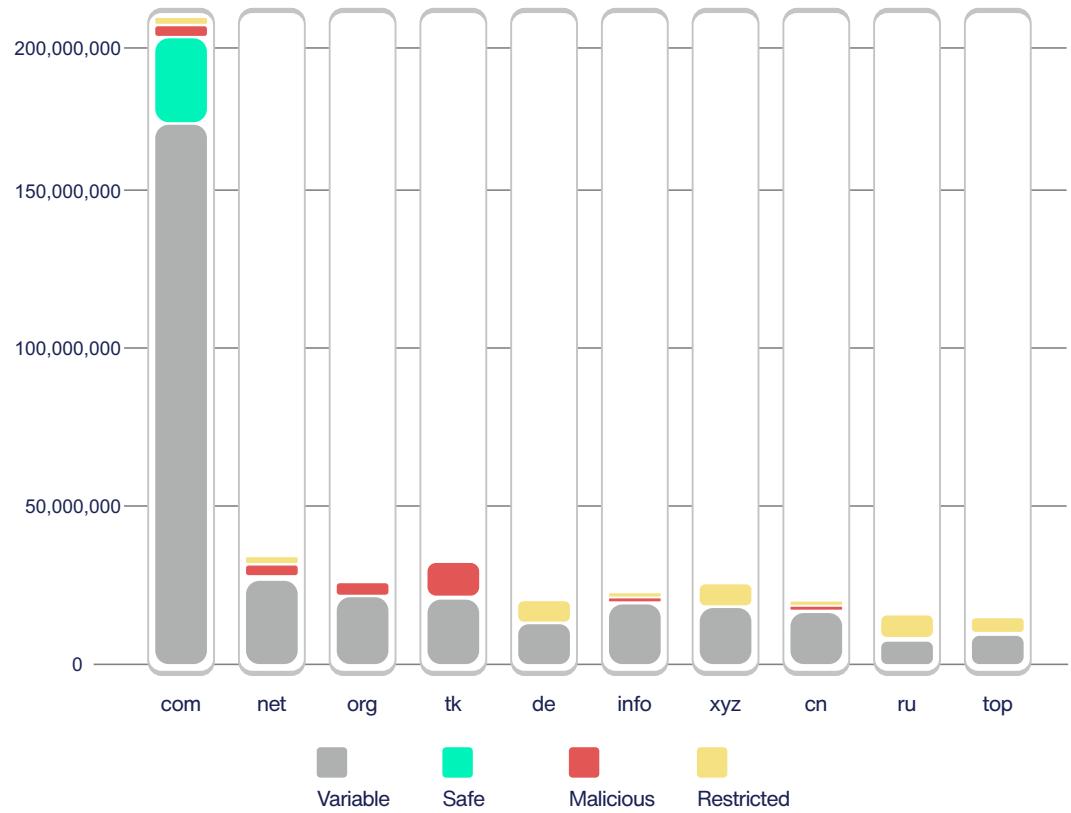


The best-known high-end extension (TLD) is ".com", ".net", ".org" and ".info" follow in the places. Although they do not differ in their presence on the internet, the importance of the domain extension you choose is much greater than you can imagine. People are often more inclined to use .com domains.

1. com	<b>251,172,752</b>	5. de	<b>13,381,135</b>	9. ru	<b>7,026,567</b>
2. net	<b>23,585,088</b>	6. info	<b>11,198,668</b>	10. top	<b>6,919,366</b>
3. org	<b>16,131,094</b>	7. xyz	<b>10,466,556</b>		
4. tk	<b>15,015,450</b>	8. cn	<b>8,659,751</b>		

# Most Used Top 10 TLDs Worldwide

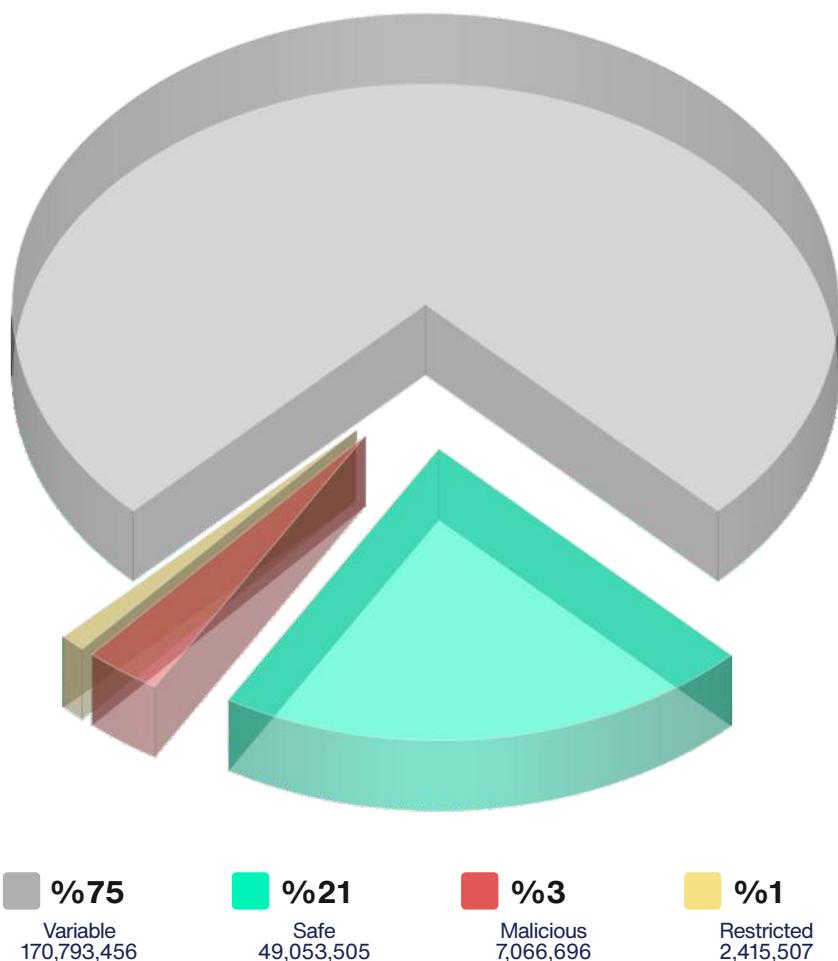
## Top 10 TLDs with Category Groups



Although the number of domains ending with .tk is small, it has been observed that the rate of malicious domains is very high. However, there are currently more than 1,200 TLDs. The wide variety of TLDs available provides threat actors with more opportunities to conduct their operations, often at a lower cost.

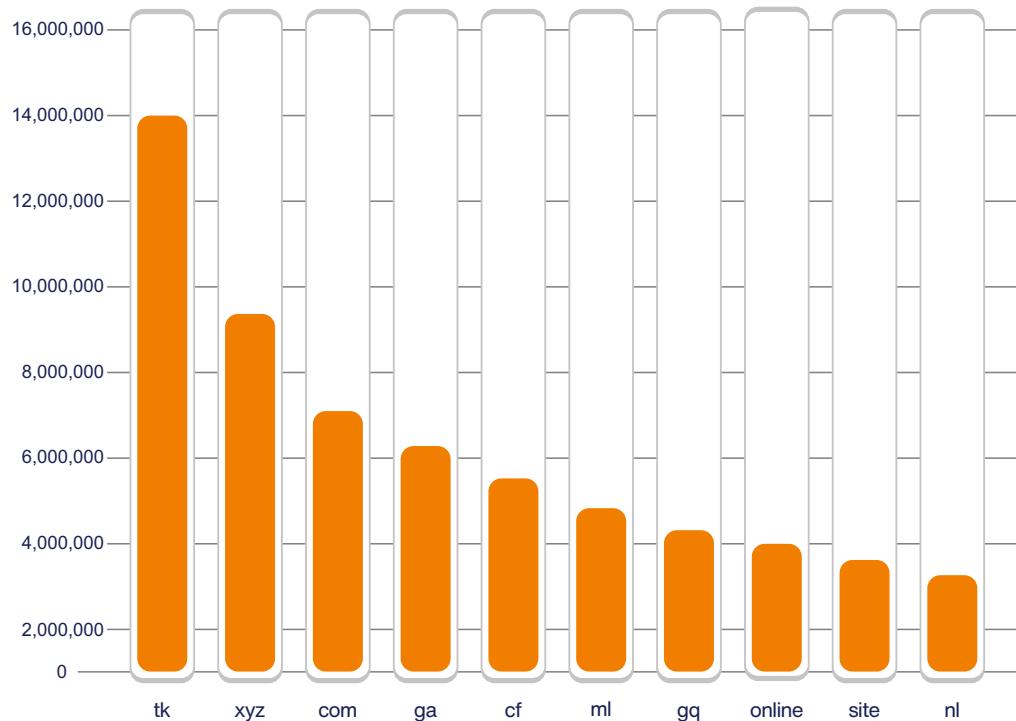
## Most Used Top 10 TLDs Worldwide

.com Category Distribution



# Top TLDs Contains the Most Malicious Domains

## Top TLDs Contains the Most Malicious Domains

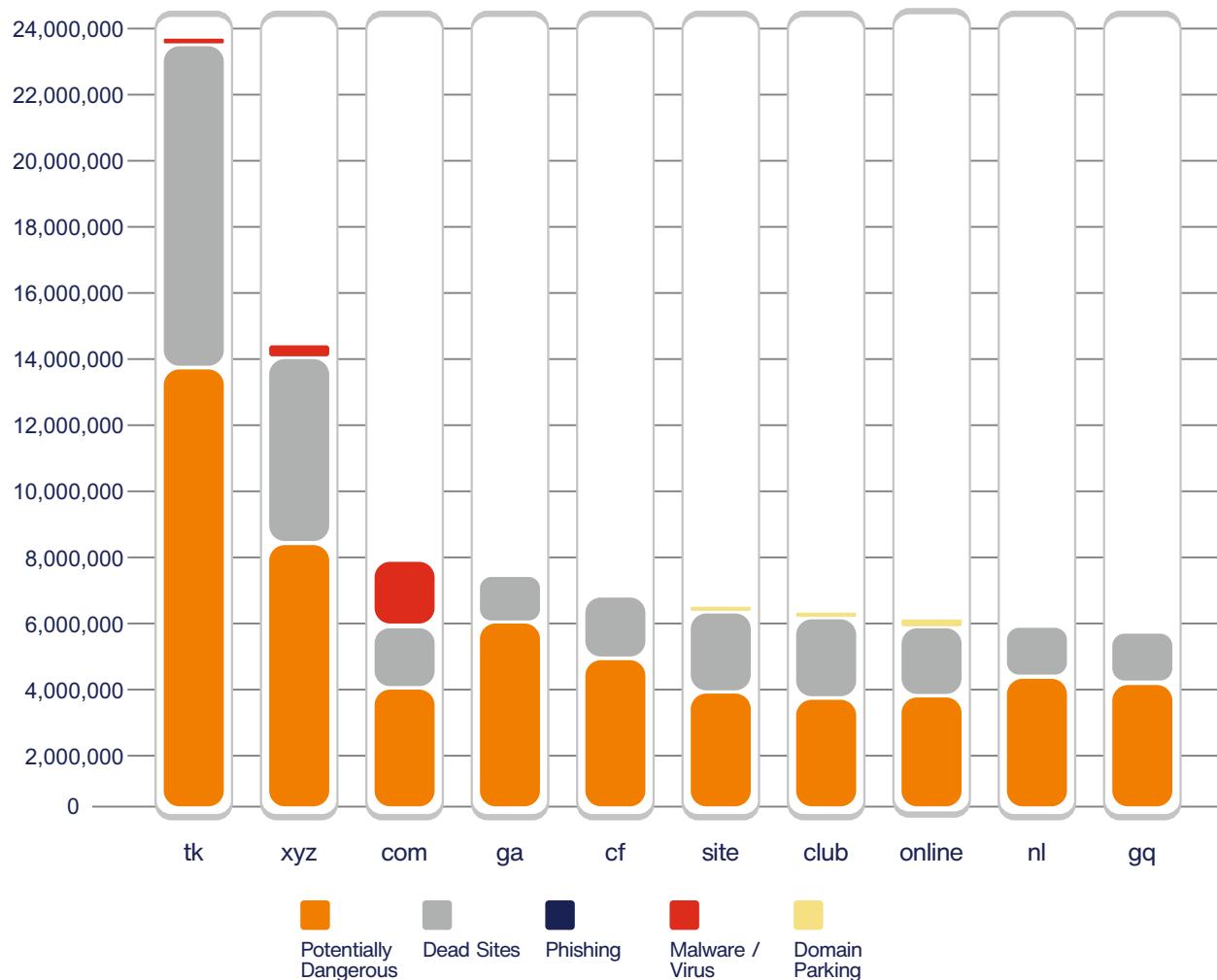


1. tk	<b>14,089,992</b>	5. cf	<b>5,301,193</b>	9. site	<b>3,742,271</b>
2. xyz	<b>9,257,449</b>	6. ml	<b>4,896,131</b>	10. nl	<b>3,612,746</b>
3. com	<b>7,066,739</b>	7. gq	<b>4,409,601</b>		
4. ga	<b>5,964,678</b>	8. online	<b>3,926,376</b>		

Although the most popular top-level domain is .com, many malicious domains are .tk domains. Since there are too many domains in the .com TLD, demand is very high and expensive. tk domains can be found free. Scammers tend to use this domain because it is one of the most commonly used and cheap/free domains. In addition to this, Island countries offer anonymous domain registrations like Tokelau (.tk) and Gabon (.ga) in the Pacific Ocean.

# Top TLDs Contains the Most Malicious Domains

## Top TLDs Contains the Most Malicious Domains



Among the most popular TLDs, it was determined that the Phishing and Potentially Dangerous domains were mostly hosted in 'xyz' and 'tk' domains.

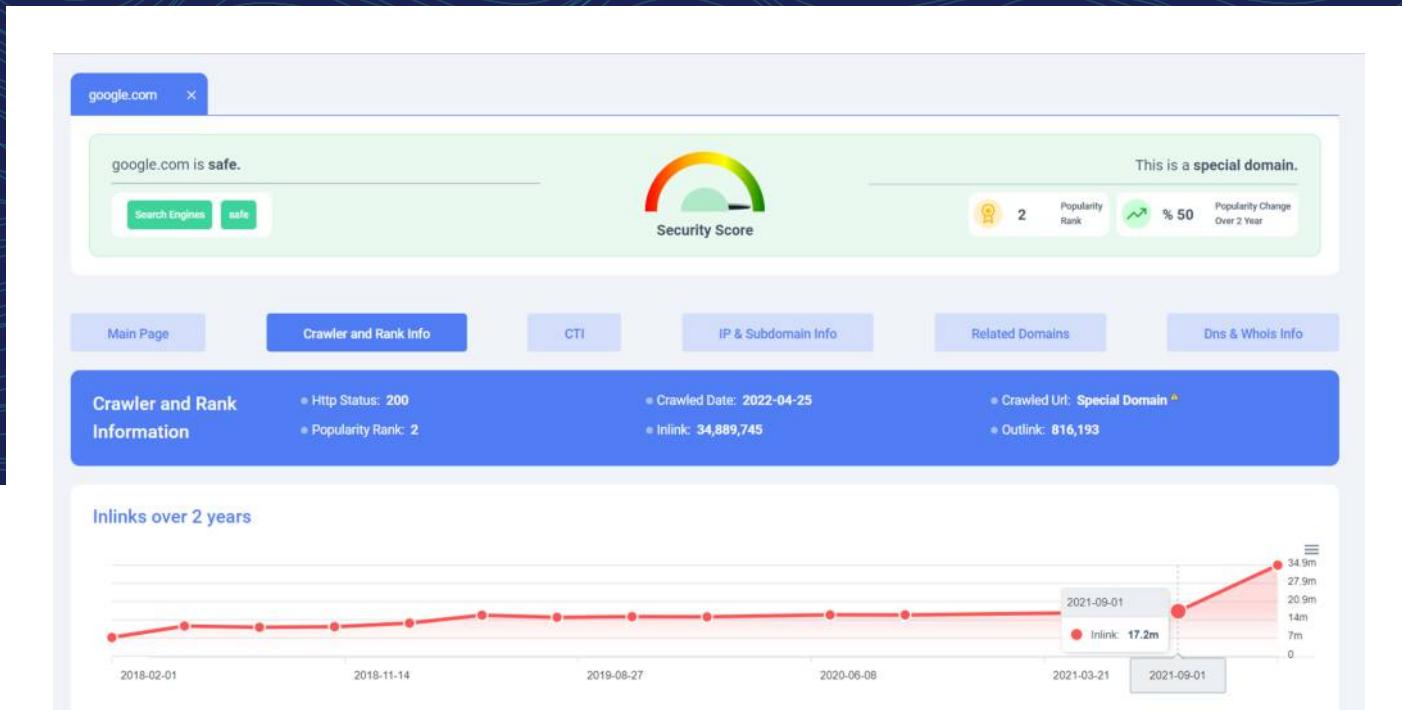
## About Cyber X-Ray

Cyber X-Ray is an AI-powered platform that provides detailed analysis for websites in all forms and contents. It continuously scans internet assets' (domain, IP, FQDN, SSL certificates, web pages, etc.) security futures, content, popularity, blacklisting information, in-links and out-links data for scoring.

Thanks to the 100% AI-based domain classification infrastructure, domain content and security risk level can be calculated instantly. In addition to the newly classified domains, the constant re-categorization of domains on the Cyber X-Ray platform continues.

Domains which are not in the Cyber X-Ray database are marked as 'First-seen' domains by the artificial intelligence. Cyber X-Ray scores 'First-seen' domains in 10 minutes with its artificial intelligence and deep learning algorithms.

To avoid false positives, malicious domain data is also gathered from nearly 400 Cyber Intelligence Centres, including the USOM, which strengthens the scoring process but does not affect the categorization per se.



Cyber X-Ray collects and compiles statistics about the internet based on collected data from 550 M+ domains and 2.4 billion FQDNs, historically.

You can search for any domain by entering the address;

<https://cyber-xray.com/>

It is free of charge and gives every user the right to check a certain number of domains without registering.

The data used in the classification phase can be checked in the system with API support through a user-friendly interface. The system can be used in shards with API key identification.

Cyber X-Ray provides infrastructure services for categorizing various firewall companies and mail security-based solutions. Moreover, it is a valuable resource for cybersecurity and SEO.

# things of the internet

*Recommendations for security*

*implementing:*

**Protective DNS or encrypted DNS on  
enterprise networks**

**DNSSense**

Easiest way to be **secure**

Secureend LTD trading as **DNSSense**, is a company registered in England and Wales with company number 11978265. **Address** 338a Regents Park Road, Office 3 and 4, **London, England, N3 2NL**



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