

DNSAI COMPASS

DECEMBER 2022 REPORT

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EXECUTIVE SUMMARY

This report is the fourth publication from the DNS Abuse Institute's measurement initiative: [DNSAI Compass](#).

In our last report, our methodology identified an increase in observed levels of malware, returning to, and slightly exceeding those of May 2022, our first month of reporting. Once again, our methodology has identified an increase in observed levels of malware for October 2022 as compared to the prior reporting month. Our methodology observed that most (86%) of the domains engaged in malware in October 2022 were compromised.

Our outreach work continues across the DNS Community. We encourage all registrars and registries to get in contact with us and take the opportunity to view the data associated with their registrar or registry. These meetings typically yield insights for both the registry or registrar and the DNSAI.

We look forward to continuing these discussions and encourage anyone interested to get in touch.

The methodology for this report is the same as all other reports (v1.0) and we encourage readers to consider this detailed methodology and contact us with questions, ideas, or suggestions to help us improve this initiative. After all, we are here to support the DNS Community and make it better equipped to tackle DNS Abuse.

The DNS Abuse Institute will periodically publish reports on [DNSAI Compass](#).

ABOUT

The **DNS Abuse Institute** (DNSAI or the “Institute”) was created in 2021 by **Public Interest Registry** (“PIR”) in pursuit of its non-profit mission. The Institute aims to reduce DNS Abuse and empower the DNS community.

The Institute created DNSAI Compass (“Compass”) as a reliable, independent, transparent, and sufficiently granular way of measuring DNS Abuse in order to ultimately reduce it at the DNS level.

Compass is a collaboration with **KOR Labs**, led by **Maciej Korczynski** from Grenoble INP-UGA. This data is then provided to the DNSAI. DNSAI then works with PIR’s Data Analytics team to create the interactive charts and for the purposes of writing this report.

Our priorities for Compass are:

- **Transparency:** The methodology that collects, cleans, and aggregates the data must be as transparent as possible. To the extent that anyone should wish to, they could replicate the process.
- **Credibility and Independence:** We aim to have an academically robust and independent approach, separate from commercial interests.
- **Accuracy and Reliability:** The goal of these reports is to enable focused conversations, and to identify opportunities for abuse reduction. The data needs to be of high enough quality to serve as the foundation for meaningful changes to the ecosystem.

Our first report from **September 2022**¹ provides the methodology and further context on the background and development of this initiative.

Our approach is one of collaboration and engagement, and we endeavor to speak to interested parties and provide them with early access to data that concerns their organization. We are committed to refining this project as work continues and welcome insights from across the industry to help us iterate and improve. If you would like to review your data, please **contact us**.

For clarity, Compass exists completely independently of **NetBeacon**, the centralized abuse reporting service we created for the benefit of the DNS. Reports from NetBeacon do not go into our measurement work with Compass. This is a conscious choice to optimize and encourage usage of NetBeacon and prevent any abuse of NetBeacon as an attempt to influence Compass data. See the **methodology** for more information on how domains are included in Compass.

¹ Available at: <https://dnsabuseinstitute.org/dnsai-compass/>

Understanding this Report

This report is the third publication from the DNS Abuse Institute's measurement initiative: **DNSAI Compass**.

This report shows high level aggregate data from **May to October 2022**.

It focuses on the use of the DNS for phishing and malware:

- **Phishing** is an attempt to trick people into sharing important or sensitive information— for example logins, passwords, credit card numbers or banking information – in either a personal or business context.
- **Malware** is malicious software designed to compromise a device on which it is installed.

It includes the following charts:

- **Chart 1: Aggregate Trends**
- **Chart 2: Mitigation**
- **Chart 3: Registrar Median Mitigation Time**
- **Chart 4: Malicious vs. Compromised**

Our [methodology](#) provides important context and we recommend it is read in full.

Each chart is accompanied by:

- **'About this Chart'** to help the reader understand the data being displayed, and;
- **'Commentary'** where we have added any observations on the data.

Where we are showing data over time, the intent is to try and demonstrate trends, year over year, and we are therefore hoping to be able to display about two years of data depending on functionality and viewability.

GENERAL DNS ABUSE TRENDS

These charts are available in an interactive format on our [website](#). They provide a broad overview of our findings on DNS Abuse trends.

Chart 1: Aggregate Trends

About this Chart

This chart provides a high level view on how much DNS Abuse has been identified by our methodology, and how it's changing over time. It shows the absolute volume of unique domains our methodology has identified are engaged in phishing and malware, broken out by category.

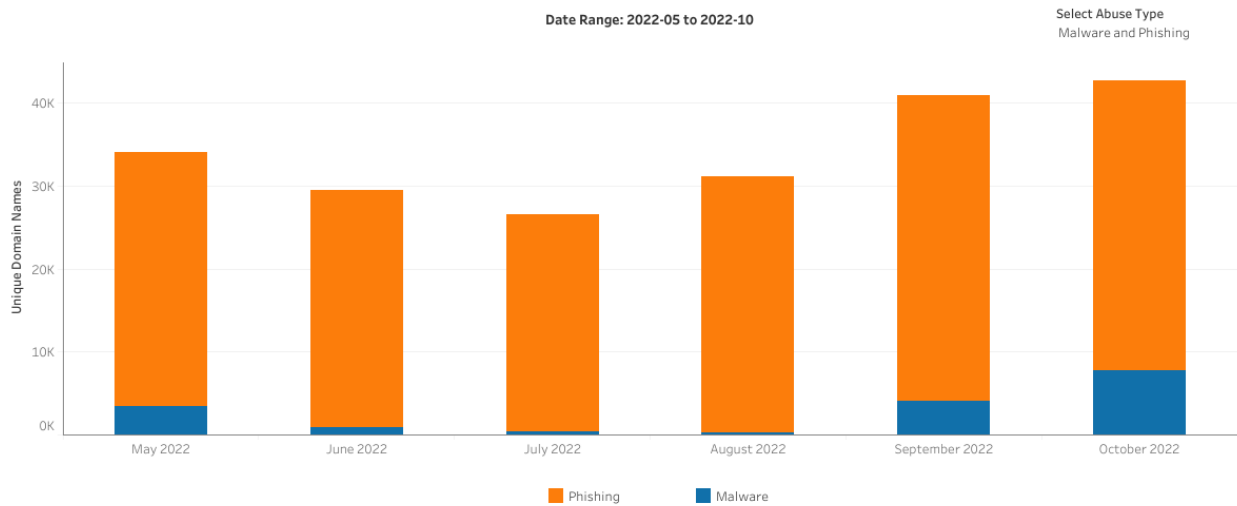


Figure 1: Aggregate Trends - Phishing and Malware

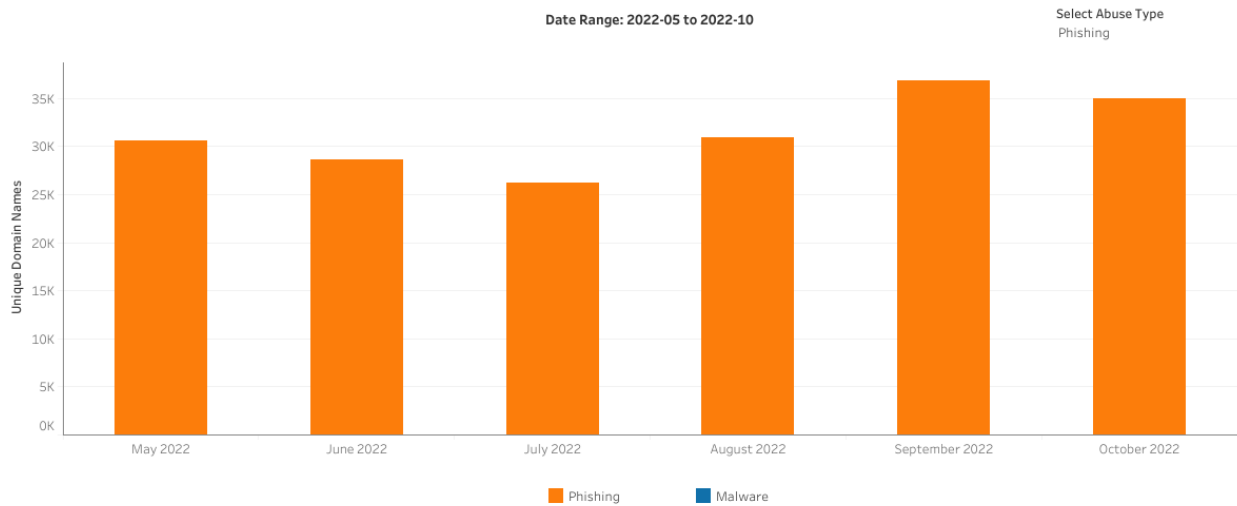


Figure 2: Aggregate Trends - Phishing

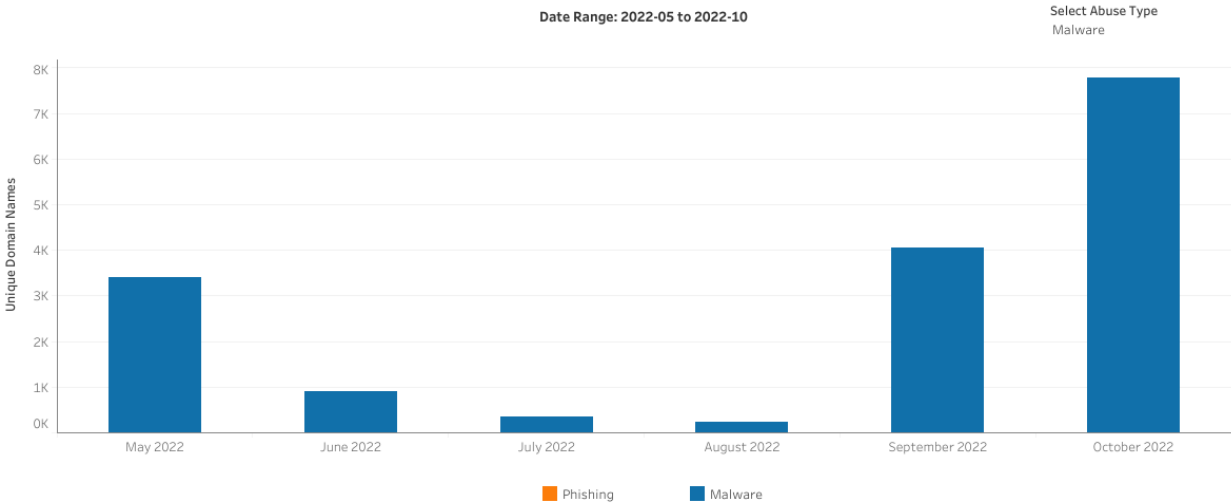


Figure 3: Aggregate Trends - Malware

Commentary

In our first two reports we observed a drop in the number of malware domains identified by our methodology. This month the number of malware domains we observed increased again and exceeded our last month of reporting, which was the first month where our methodology observed an increase in malware (September 2022 data observed in our November 2022 Report).

Chart 2: Mitigation

About this Chart

This chart provides a high level view on how much DNS Abuse mitigation has been identified by our methodology, and how it's changing over time. The methodology includes a process to determine whether any mitigation has been observed. This involves taking an initial measurement of various factors related to the URL and repeating these measurements for one month. Further details are set out in the [methodology](#).

This results in four labels:

- **Mitigated:** We detected that a mitigating action has occurred. This action could have been taken by a registrar, registry, a hosting provider, or another relevant actor, including the registrant.
- **Not Mitigated:** We did not detect any indication of mitigation.
- **Uncategorized:** We were unable to determine whether or not mitigation occurred.
- **Unprocessed:** The domains were not processed due to network connectivity, server problems, or other similar issues.

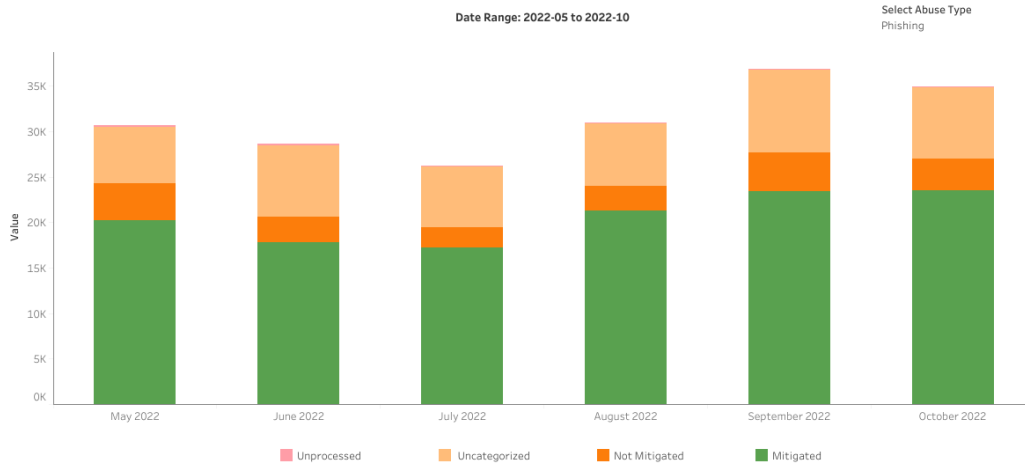


Figure 4: Mitigation - Phishing

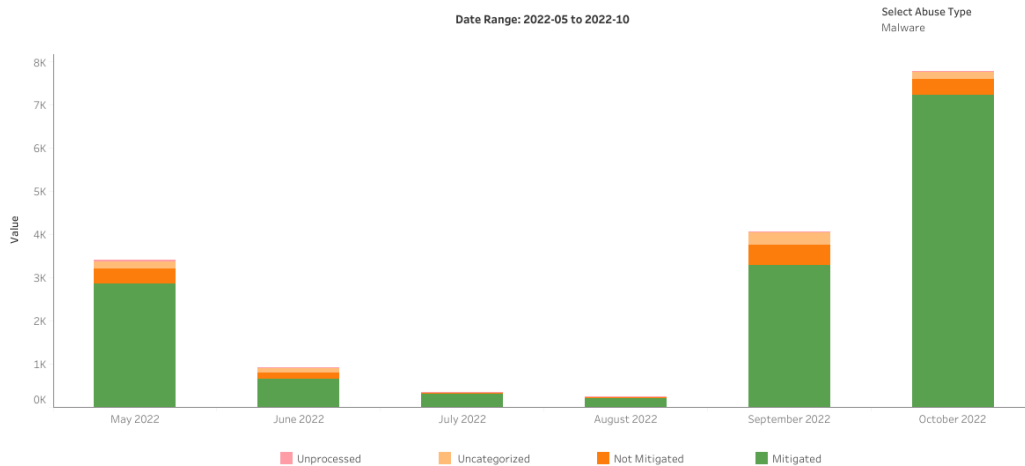


Figure 5: Mitigation - Malware

Commentary

Our methodology continues to observe high rates of mitigation (93%) for malware despite the increase in unique domains observed to be engaged in malware. More detailed information is available in the interactive charts on [our website](#).

Chart 3: Registrar Median Mitigation Time

About this Chart

This chart is intended to show the observed time taken to mitigate phishing and malware, and how it is changing over time. For the domains that our methodology determined were mitigated, this chart shows how many registrars had a median time to mitigation in each category.

After an initial measurement, KOR Labs repeats measurements for one month to determine if mitigation has occurred. The intervals used are (starting at the time of acquiring the URL from the blocklist): 5m, 15m, 30m, 1hr, 2hr, 3hr, 4hr, 5hr, 6hr, 12hr, 24hr, 36hr, 48hr, and then once every 12 hours for one month.

While we are describing this information as a “median registrar mitigation time”, it should be noted that we do not know definitively that it was the registrar that took action. This data could include mitigation taken by the registry, the host, or any other relevant party. The reference to a registrar is indicative that the domain is under their management.

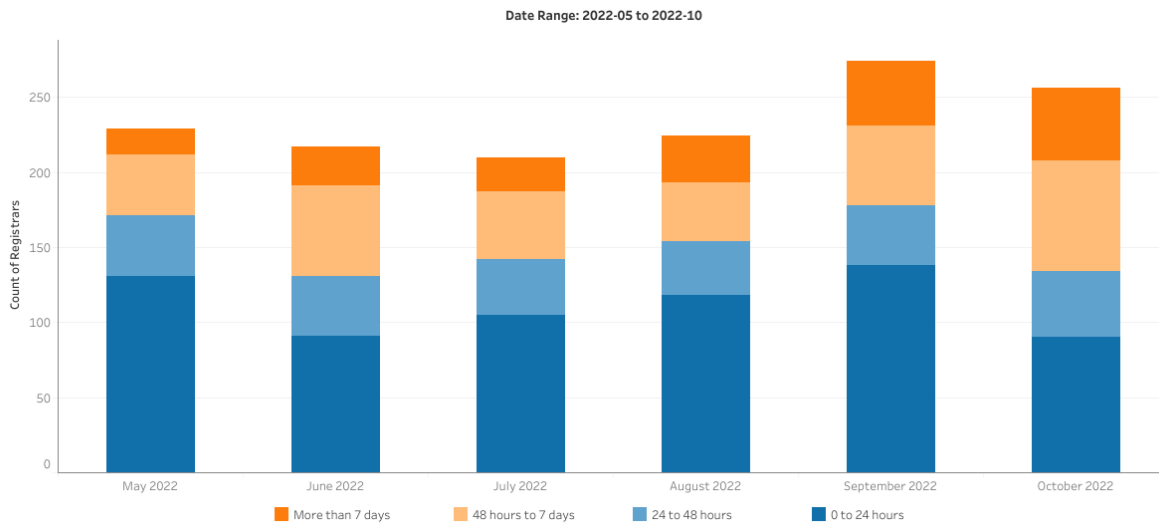


Figure 6: Registrar Median Mitigation Time

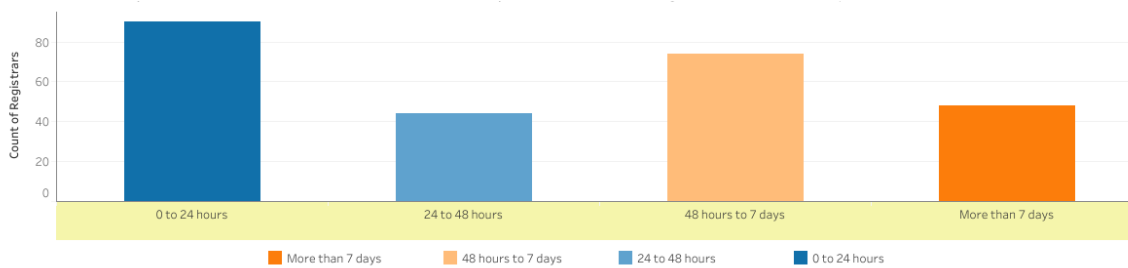


Figure 7: Registrar Median Mitigation Time - October 2022

Commentary

There is no agreed upon industry standard for how quickly mitigation should occur. This makes the presentation of mitigation time challenging. We believe there is a general industry view that mitigation within 24 hours is considered a quick response to sufficient evidence of phishing or malware. As phishing and malware are quite time-sensitive issues, with most harm happening at the start of the attack, we believe that mitigation after 7 days is not quick enough to prevent and disrupt harm, which is why we have included “More than 7 days” as a specific category.

Chart 4: Malicious vs. Compromised

About this Chart

This chart is intended to show the observed registration type (malicious vs. compromised) and how this is changing over time.

Our methodology includes three labels:

- **Malicious:** a domain registered for malicious purposes (i.e., to carry out DNS Abuse).
- **Compromised:** A benign domain name that has been compromised at the website, hosting, or DNS level.
- **Uncategorized:** A domain that our methodology was unable to categorize for a number of reasons, including problems in collecting the metadata necessary to categorize domain names accurately.

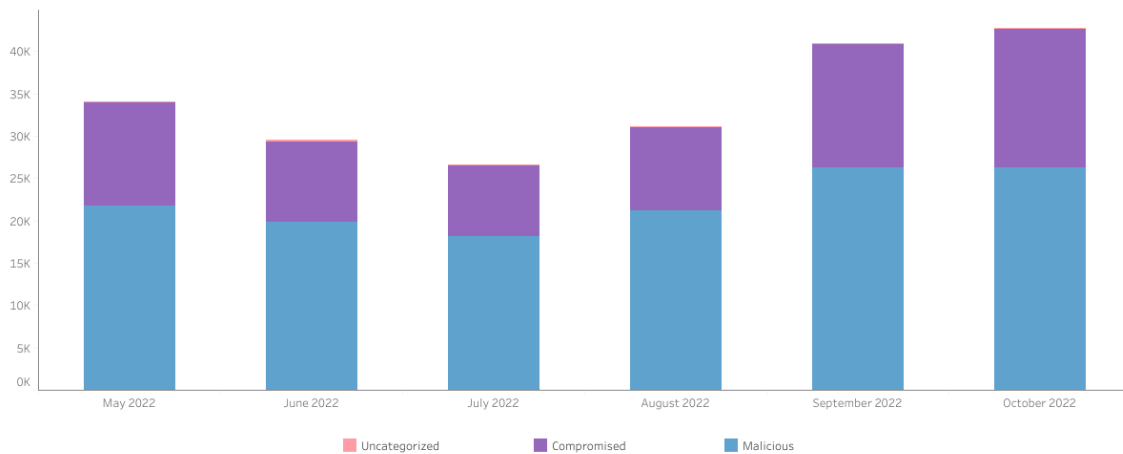


Figure 8: Compromised vs Malicious - Phishing and Malware

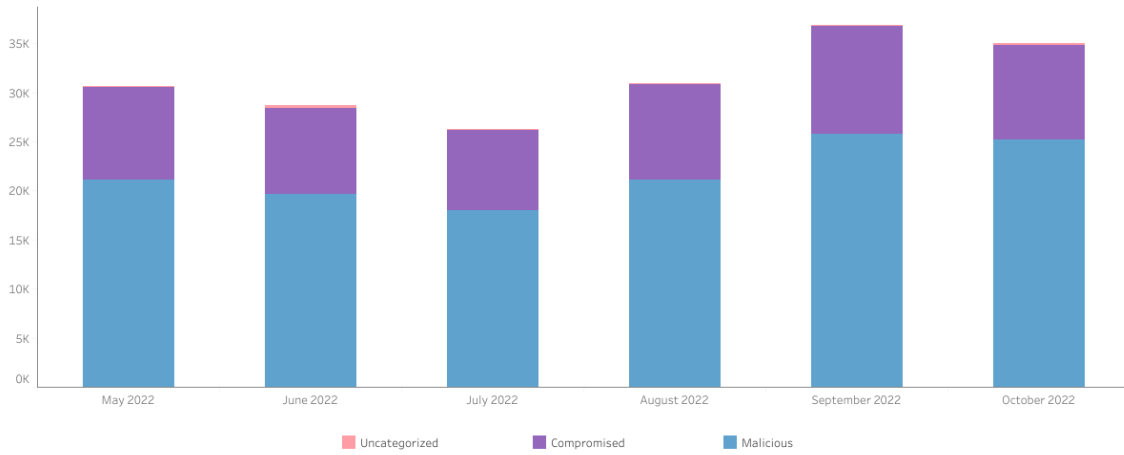


Figure 9: Compromised vs Malicious - Phishing

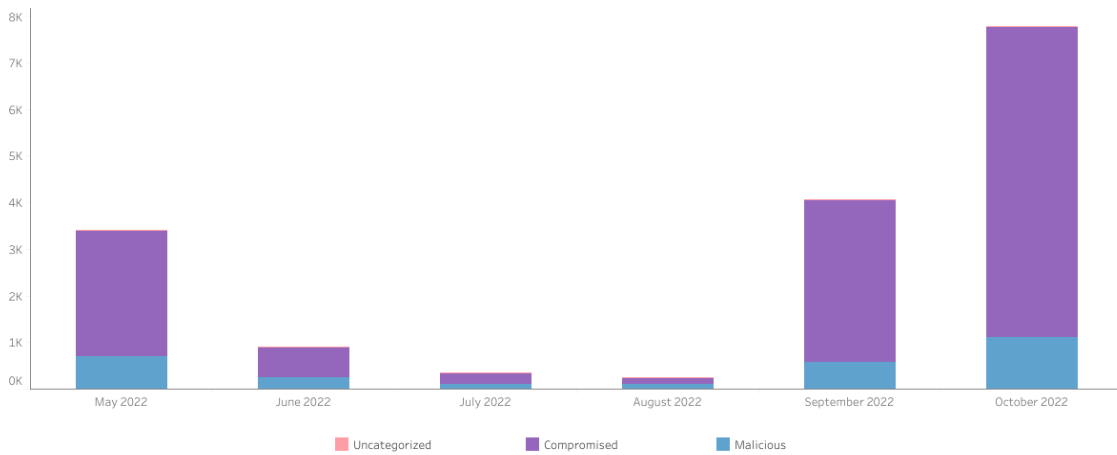


Figure 10: Compromised vs Malicious - Malware

Commentary

Our methodology observed that most (86%) of the domains engaged in malware in October 2022 were compromised. More detailed information is available in the interactive charts on our [website](#).

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