

WHAT IS THE IDENTIFIER TECHNOLOGIES HEALTH INDICATORS (ITHI) PROJECT?



ITHI, or Identifier Technologies Health Indicators, is an ICANN initiative to measure the “health” of the identifier system that ICANN helps coordinate. The goal is to produce a set of indicators that will be measured and tracked over time that can be used to determine if the system of identifiers is overall doing better or worse. This is a long-term project, expected to run for a number of years.



TECHNICAL FOCUS

The ITHI project is strictly technical. Its role is to define metrics, perform measurements and assess trends over time in important areas related to the Internet’s identifier systems.

Metrics are currently measured in the following areas:

- Inaccuracy of WHOIS Data
- Domain Name Abuse
- DNS Recursive Server Analysis
- DNS Resolver Behavior
- IANA Registries for DNS Parameters
- DNSSEC Deployment
- DNS TLD Traffic Analysis

All current results are available at: <https://ithi.research.icann.org>



HOW DATA IS COLLECTED

ITHI collects data mainly from three sources: internal ICANN data mostly coming from the ICANN Managed Root Server (IMRS), partners running ICANN-provided software on their infrastructure (white box approach), and a special partnership with APNIC to make user-facing measurements (back box approach).

Typical partners include Internet Service Providers (ISPs) running recursive DNS resolvers and TLD operators running authoritative DNS servers.

Using the ITHI tool, operators will take samples of DNS traffic a few times per week and the samples will be automatically processed locally.

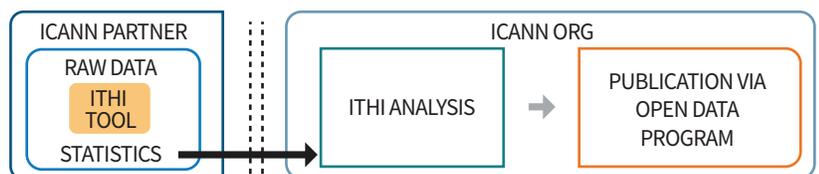
This tool is open source, available on Github and has been code reviewed by NLabs. It takes only about ten minutes to install. Binary packages are available for recent builds of Centos, Fedora, and Ubuntu.

As the tool runs, it collects statistics (and only statistics) devoid of any Personally Identifiable Information (PII). ITHI partners send those statistics back to ICANN periodically. Partners can choose to automate this process. ICANN staff is ready to assist in installing this software.



PRIVACY CONSIDERATIONS

Great emphasis is placed on protecting the privacy of ITHI sources. The software that is installed is only collecting statistics about DNS traffic and is not gathering any information about zone files or related to zone files. Any personal identifiers are removed. ICANN org will only receive the aggregated statistics for analysis and will further aggregate the results in order to publish them to the community.



NO PERSONALLY IDENTIFIABLE INFORMATION (PII), ONLY STATISTICS ARE SENT TO ICANN ORG

This diagram shows the ITHI process and the privacy barrier between sources and publication.



SECURITY CONSIDERATIONS

The ITHI tool can be operated in different modes to match the security requirements of the partner's organization.



DATA PUBLICATION

An aggregate view of all data captured at the various collection points is published on <https://ithi.research.icann.org> every month. Participants will be listed as contributors at their discretion. Participants in this project may opt to share their aggregate measurements with other participants in exchange for reciprocity.



WHAT PARTNERS ARE WE LOOKING FOR?

ICANN org is looking for partners around the world that operate DNS recursive resolvers serving large number of clients, e.g., Internet service providers or operators of authoritative DNS servers, such as top-level domains registries.



WHY PARTICIPATE?

By the aggregated data of the ITHI project, a baseline can be set which shows how Internet traffic is usually behaving and helps making any new or unusual trends visible. This baseline can act as an early warning system, enabling the detection of patterns that are precursors to attacks.

The more participants we have onboard, the better the quality of the data that is needed to establish this baseline or abnormalities that could indicate that an attack is on its way.

By contributing with your data, you are not only contributing to the common good of understanding the Internet, but you also will be able to monitor your network, see if there are any trends to be concerned about, and whether something is unusual compared to your peers' networks.



WHAT CAN ITHI TELL US ABOUT THE DNS?

Here are a few major statistics tracked by ITHI:

- 1 As of September 2020, 43% of all DNS queries to the DNS root came from Google Chrome (and derivative) browsers sending queries for non-existing, randomly generated names 7 to 15 characters long to test for global Internet connectivity. Google is aware of the issue and has taken steps to address it. As of February 2021, this number is down to 26%.
- 2 About 200 DNS recursive resolvers receive queries from 50% of the Internet user population. About 2000 resolvers receive queries from 90% of all users. These numbers have been relatively stable over the last 18 months.
- 3 About 30% of DNS recursive resolvers perform DNSSEC validation.
- 4 The top three queried non-existent TLD labels seen at the root are: .local (7.5%, which used to be about 4%), .home (3.7%, which used to be 2.9%), and .internal (2%)



MORE INFORMATION

For more information, visit: <https://www.icann.org/ithi-faqs> or contact: ithi-info@icann.org.