

# Study reveals impact of public DNS services; researchers develop tool to help

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A new study by Northwestern University researchers has revealed that public DNS services could actually slow down users' web-surfing experience. As a result, researchers have developed a solution to help avoid such an impact: a tool called namehelp that could speed web performance by 40 percent.

Through a large-scale study involving more than 10,000 hosts across nearly 100 countries, Fabián Bustamante, associate professor of electrical engineering and computer science at Northwestern's McCormick School of Engineering and [Applied Science](#), and his team found that one cause of slow web performance is a growing trend toward public Domain Name Systems (DNS), a form of database that translates Internet domain and host names into Internet Protocol (IP) addresses.

DNS services play a vital role in the Internet: every time a user visits a website, chats with friends, or sends email, his computer performs DNS look-ups before setting up a connection. Complex web pages often require multiple DNS look-ups before they start loading, so users' computers may perform hundreds of DNS look-ups a day. Most users are unaware of DNS, since Internet Service Providers (ISP) typically offer the service transparently.

Over the last few years, companies such as [Google](#), OpenDNS, and Norton DNS have begun offering "public" DNS services. While "private" DNS services, such as those offered by ISPs, may be misconfigured, respond slowly to queries, and go down more often,

public DNS services offer increased security and privacy, and quicker resolution time. The arrangement is also beneficial for public DNS providers, who gain access to information about users' web habits.

Bustamante and his team found that while using public DNS services may provide many benefits, users' web performance can suffer due to the hidden interaction of DNS with Content Delivery Networks (CDNs), another useful and equally transparent service in the web.

CDNs help performance by offering exact replicas of website content in hundreds or thousands of computer servers around the world; when a user types in a web address, he is directed to the copy geographically closest to him. Most popular websites – more than 70 percent of the top 1,000 most popular sites, according to the Northwestern study – rely on CDNs to deliver their content quickly to users around the world.

But researchers found that using public DNS services can result in bad redirections, sending users to content from CDN replicas that are three times farther away than necessary.

Public DNS and CDN services are working to address the problem, but current users are left with two mediocre options – bad web performance through public DNS services or bad security and privacy support through private DNS services.

Now Bustamante and his group have developed a tool called namehelp that may let users have their cake and eat it, too – by using public DNS services without compromising on web performance.

namehelp runs personalized benchmarks in the background, from within users' computers, to determine their optimal DNS configuration and improve their web experience by helping sites load faster. If it finds that a user is receiving less than optimal web performance, namehelp

automatically fixes it by cleverly interacting with DNS services and CDNs to ensure the user gets his content from the nearest possible copy.

Provided by Northwestern University

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