

# SaTC: CORE: Medium: Collaborative: Studying the Impact of IPv6 on Information Controls and Censorship Circumvention

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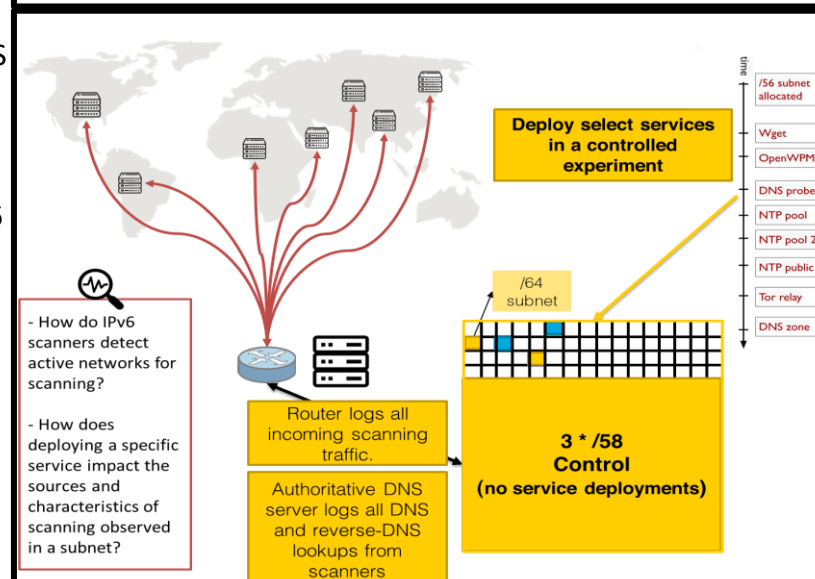
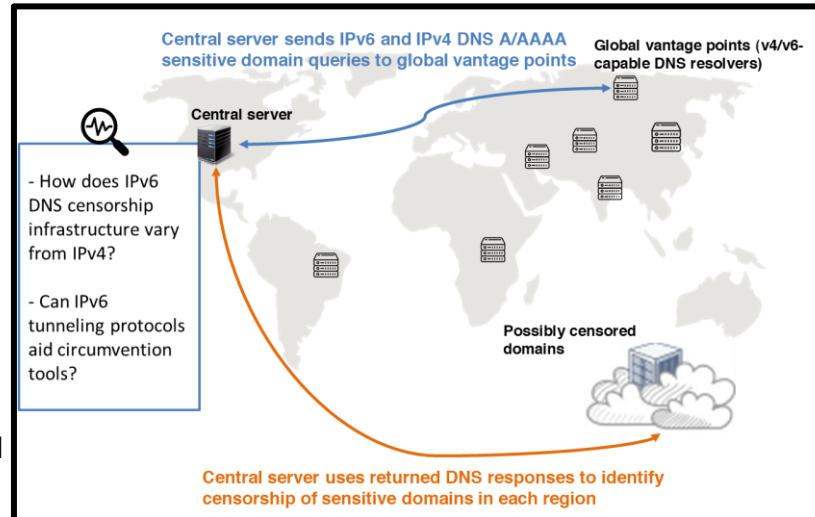
**Challenge:** Existing tools for censorship circumvention were designed for an IPv4 Internet and do not consider or exploit the impact of the IPv6 protocol on censorship infrastructure.

## Solution:

(1) *Updating existing tools.* We made Conjure, a popular circumvention tool, IPv6 capable.

(2) *Developing new tools.* We take a measurement-first approach. We conduct measurements to understand how censors handle artifacts of IPv6 and then use insights from these measurements to develop IPv6-focused circumvention tools. *New contributions to date include:*

- Global measurements of IPv6 DNS resolver behaviors and their impact on DNS censorship deployments.
- In-the-wild measurements of IPv6 scanning to understand how censors may identify hidden proxies.
- Reverse-engineering China's methods for detecting and blocking encrypted circumvention channels.



## Scientific Impact:

(1) *Methodologies.* This project will produce new techniques to measure censorship and related behaviors on remote networks.

(2) *Data.* This project will produce data regarding the prevalence of Internet censorship and highlight how the IPv6 transition is being handled globally.

(3) *Tools.* This project will improve the capabilities of existing circumvention tools and produce new designs for IPv6-focused circumvention tools.

## Broader Impact and Participation:

*Internet freedom.* This project will improve the ability of citizens in repressive governments to circumvent Internet censorship.

*Transition to practice.* Conjure, a popular censorship circumvention tool, can now be used over IPv6.

*Education.* Several exercises and lectures from this project are introduced in our undergraduate "Networking" courses with peer instruction and active learning approaches. DFW rates are being monitored.