

Finding Order in a Contentious Internet



Jesse Sowell, ESD PhD Candidate

Start: September 2009

Research Group: Advanced Network Architecture Group, CSAIL

Thesis Advisor: Dr. D. Clark Committee: Prof. K. Oye (chair); Prof. C. Fine; Prof. N. Choucri; Dr. F. Field

ht humans & technology
 ud uncertainty & dynamics
 di design & implementation
 nf networks & flows
 ps policy & standards
 es energy & sustainability
 ee extended enterprises
 hd health care delivery
 ci critical infrastructures



Explorations in Cyber International Relations
 Massachusetts Institute of Technology Harvard University

Workshop on People, Power, and CyberPolitics
 MIT, December 7 and 8, 2011

engineering

management

social sciences

Problem

In 1998 an attempt to remove an offensive video blocked YouTube for most of the Internet...network operators resolved the issue in three hours. Spamhaus disseminates authoritative spam blocking lists, performing a vetting function while distributing monitoring and enforcement effort. Non-state collectives are increasingly playing function-specific Internet governance roles, often competing with conventional governance modes. Despite demonstrated operational and decisional capacity, little is known about how this capacity develops or how it is maintained. This research is an empirical, comparative analysis of governance arrangements and the implications for the ongoing design and operations of the Internet.

Key Questions

- Why do actors in these governance arrangements (institutions) cooperate?
- What elements of structure and process reinforce cooperation and contribute to operational capacity?
- Are these patterns durable, not simply one-off events?
- How contingent are patterns on the public, private, or hybrid character of the organization modes in which they are embedded?
- What factors contribute to dynamic efficiency?
- How do these governance arrangements interact with conventional modes of governance? How do they compare?
- What contributes to legitimacy, authority, and accountability in these arrangements?

Methodology

Social Network Analysis (structure)

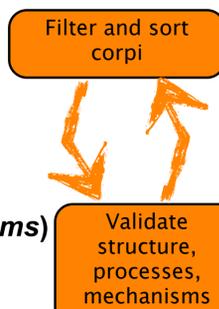
- Attendee lists (figure to right)
- E-mail speakers
- Policy co-authors

Text Mining (structure, process)

- Concept clusters in documents
- Actors related by common interests

Cases and Interviews (process, mechanisms)

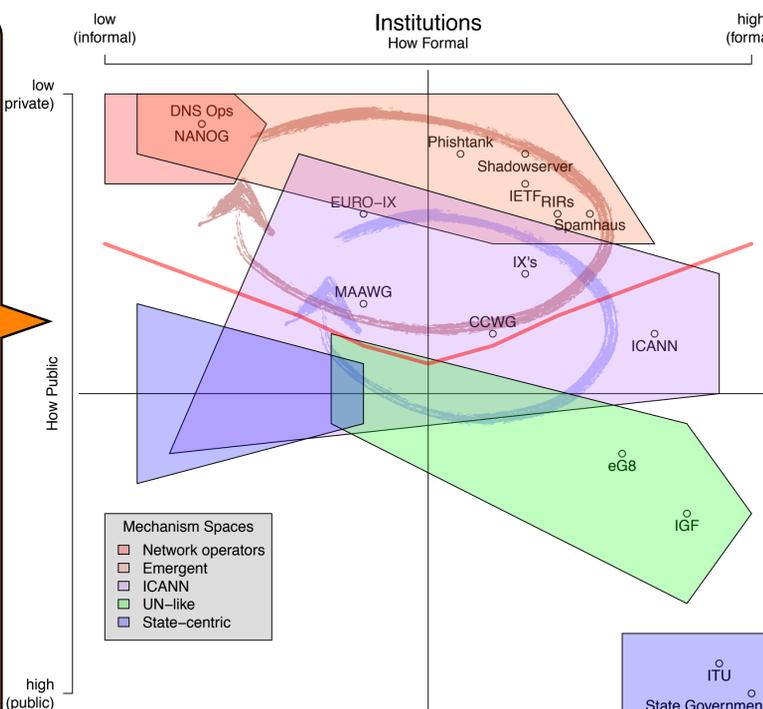
- Identify policy and issue communities
- Observation of the community
- Surface causal mechanisms



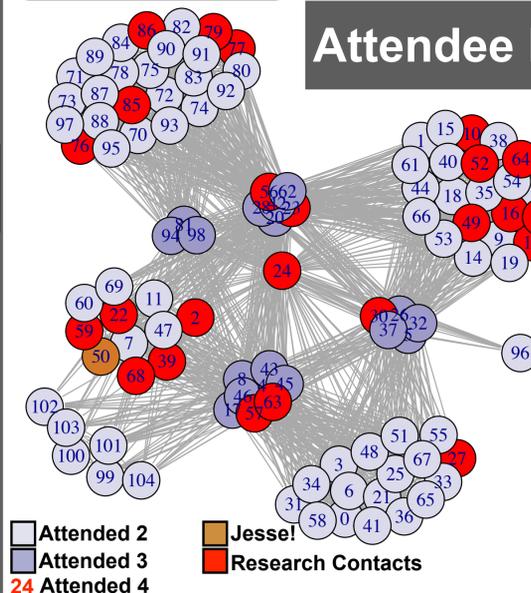
The Research

Institution Landscape and Boundaries

Two simple dimensions of institutions are (1) formality and (2) the mix and influence of public and private actors. This space illustrates the variety of organizational modes at play. Institutions are placed approximately: polygons represent the sets of governance mechanisms used by organizations and, importantly, the overlap. The red line represents the boundary, and interface, between bottom-up and top-down arrangements.



Attendee Network



- Comprises 105 actors that attended at least two of four major governance-related conferences
- Illustrates overlap between network operator community and IP resource management community
- Relation metric: number of conferences attended together
- Clusters are permutations of subsets of the four conferences
- Three "layers": attended two, attended three, core attendee (24) was at all four
- Red nodes are research contacts from recent fieldwork

Preliminary Results

- Emergent governance arrangements == private regimes
- Regime components
 - NOGs serve as informal information exchanges, reducing community uncertainty
 - RIRs engage in monitoring and some enforcement
 - Evidence of a broad, pluralistic marketplace of governance arrangements
 - Variety of accountability mechanisms
 - Confirmation of client-constituent spectrum
 - Interface with top-down arrangements
 - Active collaboration with states and IGO's
 - Collaborating organizational modes are not isomorphic

Remaining Research

Theory Building

- Preliminary results provide sufficient evidence to develop an expanded theory of private authority (chapter 3)
- Develop criteria for testing theory

Analysis

- Social network metric development
- Identify and extract issue and community clusters from documents
- Evaluate social networks and communities over time

Idiographic Studies

- Function-specific organizations
- Asia-Pacific region communities
- Revisit North America and EU
- ICANN and IGF?
- Africa and Latin America/South America?

Social network analysis and idiographic studies proceed in tandem. Analysis provides initial structure to interviews. Subsequent cases analysis provides validation of indicators and insights into hidden variables. Two more iterations, incorporating community data collection, are expected between now and Fall 2012.

Thank You!

This work is funded by the Office of Naval Research under award number N00014-09-1-0597. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author and do not necessarily reflect the views of the Office of Naval Research.

I extend my deepest appreciation to the many members of the Internet community that have contributed their time, interest, and feedback to this research. This work would not be possible without their help and support.