International Conflicts in Cyberspace

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Explorations in Cyber International Relations
Massachusetts Institute of Technology Harvard University

Cyber Security & The Governance Cap:
Complexity, Contention, Cooperation. MIT, January 6 and 7, 2014

GLOBAL FINDINGS

Actors: international & public-private cooperation essential. New players: activists & shady State contractors. U.S., Russia & China most significant actors.

Socio-Political: Most cases related to "physical" conflicts. Awareness has increased. Diverse goals & targets.

Tools: DDoS most common. Attackers not always savvy. Air-gapping insufficient.

Sophistication: State-backed and for-profit increasing the most.

Outcome: Economic hard to estimate, incentives not to report. >2/3rd cases within a handful of jurisdictions, not global.

Accountability: hard to assign, which is valuable for States. Lower entrance barriers, cost & consequences.

THE STUDY

Method: Identify relevant cases of international nature, and their socio-political context. Extract actors, their power relationships, actions, tools, outcome. Draw inferences for individual cases as well as overall findings.

# of Cases: 17. Of which 6 global.

# of Sources: 114, both academic & media. Most cited: *A Fierce Domain* of the Atlantic Council (Healy, 2013).

SELECTED CASES

Operation Solar Sunrise

Actors: Teenagers from California and Israel; The U.S. and Israel.
Tools: Known vulnerabilities in O.S. Attacking from hosts in other countries.
Outcome: Creation of JTF-CND (US) & coordination with NIPC & Private Sector.
Insights: 80's and 90's - many attacks by teenagers with grandiose goals

Chinese Espionage

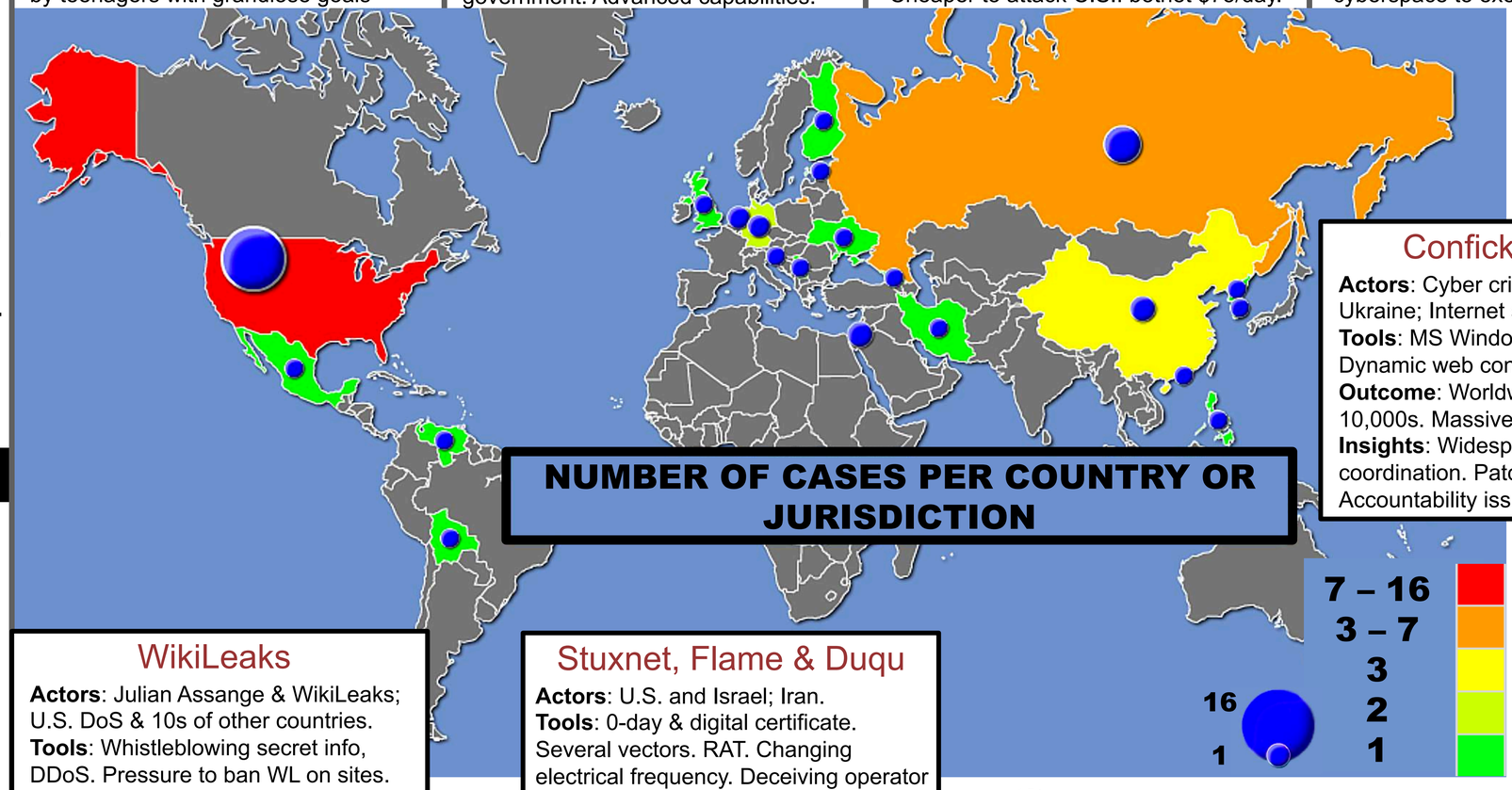
Actors: China; The U.S., allies, and over a hundred countries as targets.
Tools: 0-day, known vulnerabilities in O.S. and 3rd-party, phishing, others.
Outcome: Loss in I.P. > $250 bn. Access to advanced weapons. Use of American SW for Chinese Green Dam.
Insights: Involvement of Chinese government. Advanced capabilities.

Attacks on Estonia

Actors: Estonia, NATO & Private sector; Russia & Russian diaspora.
Tools: Spam & DDoS by botnet. ICMP, SYN & generic traffic flood. Blocking IP.
Outcome: EE cybersecurity hub. EE-Russia grew farther apart. Int'l coop.
Insights: C.S. domain for covert attacks. Developed world at higher risk. Cheaper to attack C.S.: botnet $75/day.

Russo-Georgian War

Actors: Russia & Russian organized crime; Georgia, Estonia & NATO allies.
Tools: DDoS - SQL injection & Cross-Site Scripting. Spam. 3rd country host.
Outcome: Disruption of civilian infrastructure. Russian superiority.
Insights: Some States can disrupt civilian infrastructure. Kremlin using cyberspace to exert int'l influence.



Conficker Worm

Actors: Cyber criminals, possibly from Ukraine; Internet security community.
Tools: MS Windows buffer overflow. Dynamic web control & updates.
Outcome: Worldwide victims in 10,000s. Massive for-profit botnet.
Insights: Widespread security coordination. Patches only work if used. Accountability issue: unaware victims.

WikiLeaks

Actors: Julian Assange & WikiLeaks; U.S. DoS & 10s of other countries.
Tools: Whistleblowing secret info, DDoS. Pressure to ban WL on sites.
Outcome: Massive release. U.S. spying on allies. Over 1k backups.
Insights: Reduced costs for WB. Assange's goals obscure. Undermined trust in democratic institutions.

Stuxnet, Flame & Duqu

Actors: U.S. and Israel; Iran.
Tools: 0-day & digital certificate. Several vectors. RAT. Changing electrical frequency. Deceiving operator
Outcome: Damage to 1k centrifuges in Natanz. Over 100k hosts infected.
Insights: Use of tools from cyber criminals. Equivalent to military strike. Iran now getting more involved in cyber.

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