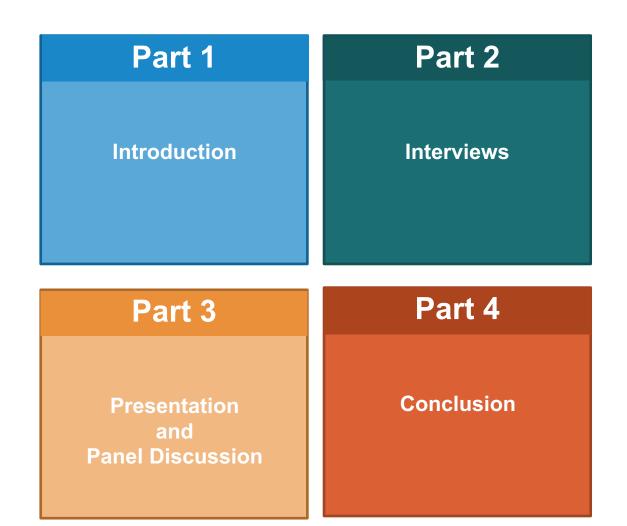




Program





Introduction



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Interviews

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Interviews



Presentation and Panel Discussion



Understanding Reputation Blocklists

ICANN's Point of View

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What are Reputation Blocklists (RBLs)?

- IP blocklists or domain (hostname) blocklists
- Regarded as malicious, untrustworthy, or simply bad reputed
 - to feed DNS firewalls to prevent malicious traffic from coming into one's network or connecting to malicious domains or IP addresses
 - to filter out spam or phishing email
 - used by large content delivery networks to prevent delivery of malicious content to their customers
 - as part of incident response or law enforcement purposes, to identify malicious infrastructure involved in attacks
- Sharing mechanisms
 - Commercial: available through rate-limited, license-based, or pay-per-use mechanisms and are maintained by for-profit companies specialized in threat intelligence
 - Open source: openly and freely available for anyone to collect and use, provided by diverse set of companies
- Threat specific (e.g., PhishTank) as opposed to more general lists (e.g., SURBL)



General Characteristics & Draw backs

- Overspecialization: Each list geared towards specific purpose [1]
- <u>Limited coverage & overlap, limited vantage points:</u> datafeed maintainers may have honeypots in certain geolocations, therefore they may miss malicious sources [2,4]
- <u>Limited transparency/documentation on internal methods:</u> a general lack of documentation of data collection and curation processes
- Absence of unified methodology: substantial methodological differences in data collection, curation, maintaining, and labeling blocklists which can lead to different effects on coverage, reliability, effectiveness, and speed of reporting (aka update cycle) [2]



Why is it Important to Know the Drawbacks?

- To inform users such as network operators, researchers, security companies relying on these security resources
- To design more effective defenses and curation methods that account for the complementary strengths and limitations of individual blocklists when used in isolation or in combination



ICANN SSR's use of RBLs

- Domain Abuse Activity Reporting (DAAR)
 - Takes domain names from TLD registry zone files
 - Takes domain names from a preselected set of reputation feeds for phishing, malware, botnet command & control and spam as a delivery vector ***
 - III. Overlaps domains from the first and second step
 - IV. Processes and calculates daily rate of domains in zone that appear in the RBLs
 - v. Generates daily, monthly and time series statistics, analytics and visuals to see
 - Where DNS security threats are concentrated
 - How this concentration changes over time



ICANN SSR's use of RBLs

- ICANN Compliance Support (SSR's research)
 - Takes domain names from TLD zone files
 - Maps domain names to their corresponding registrar IDs and registrar families using the BRDA** data
 - Takes domain names from a preselected set of RBLs for phishing and malware for a specific period of time ***
 - Collapses domains from the first and second step
 - Calculates metrics showing which registrars have a higher degree of security threat concentrations in one point of time and over time



^{**} Important to note that so far we only can use BRDA for compliance purposes

^{***} This step contains extensive preprocessing, cleaning, unifying the RBL data feeds

ICANN SSR's use of RBLs

- Other research projects
 - Predicting DNS threats
 Historical analysis of the RBLs can be used to extract patterns that characterize malicious domains

- Distinguishing maliciously registered vs. compromised domains using a similar technique to COMAR [5]
 - Only a subset of domain-based RBLs make this distinction



ICANN's Current Evaluation Criteria

- We monitor reputation feeds for a period of time before including any as part of our research work. We use:
 - Reputed lists within academia and industry based on publications
 - Lists with better documented data sanitization and record removal processes & compliment the existing set, in terms of coverage



ICANN's Future Evaluation Criteria

- We are working on developing a more comprehensive method to evaluate an RBL in terms of
 - Purity
 - Manual False Positives/False Negatives analysis based on a ground truth
 - Coverage
 - The percentage of overall threat domains that are listed
 - Responsiveness
 - Indication of responsiveness of one reputation feed in comparison to the others in a set
 - Accuracy
 - How detailed the information of a domain is in a reputation feed
 - Agility / Stability
 - The consistency of domain names / ranking in lists
 - Liveliness
 - How much of listed domain names are TPs and active when they appear in a feed

Among others



References on Block List Evaluations

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Conclusion





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