Cyber Security Research in Luxembourg and abroad

or Improving Data Sharing to Increase Security Research Opportunities

CIRCL
Computer Incident
Response Center
Luxembourg

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TLP:WHITE

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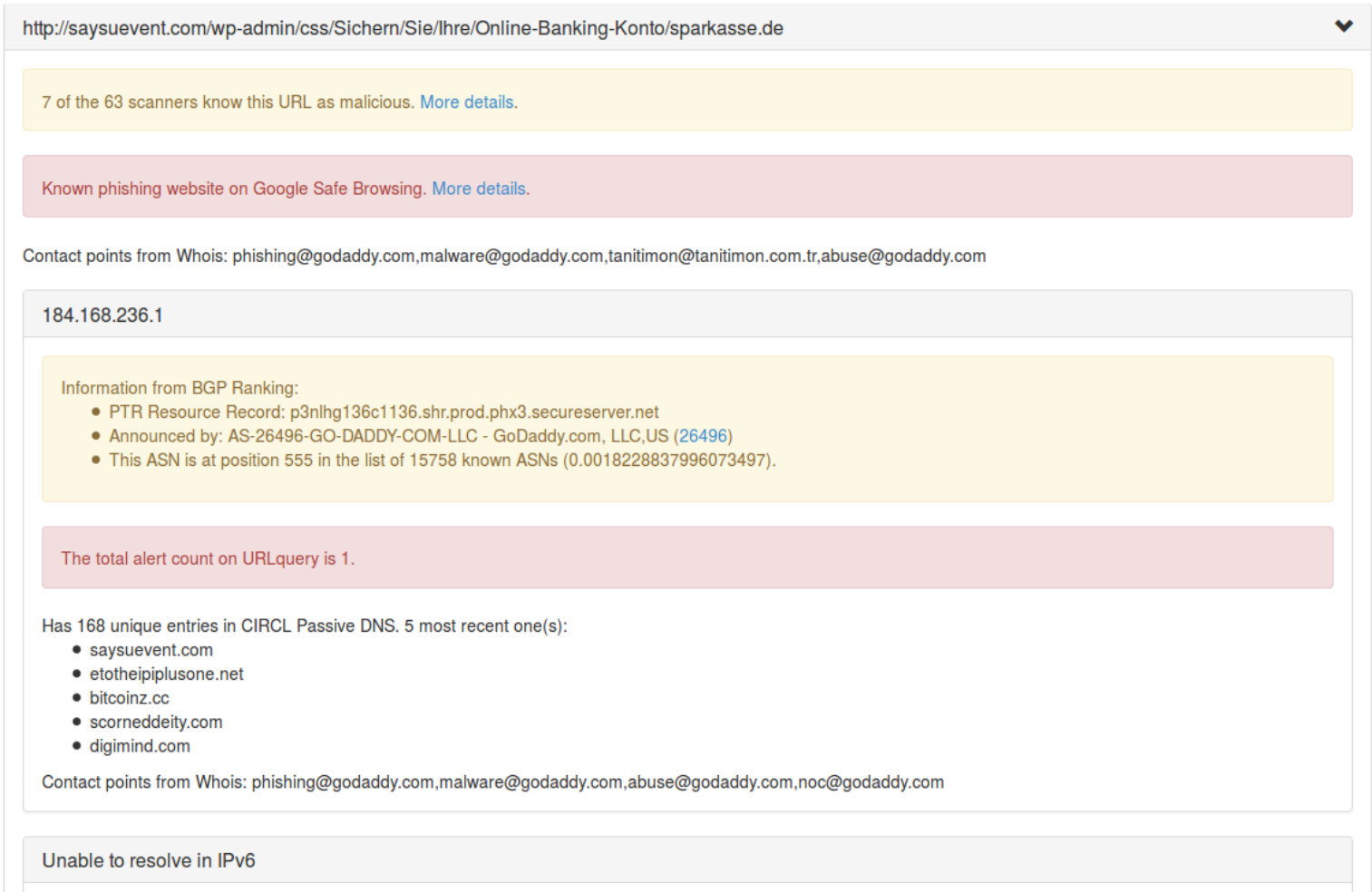
- The Computer Incident Response Center Luxembourg (CIRCL) is a government-driven initiative designed to provide a systematic response facility to computer security threats and incidents.
- CIRCL is the CERT for the **private sector**, communes and non-governmental entities in Luxembourg.
- Our core objective is to support the building of a secure economy.

Cyber security needs data for analysis

- In the scope of the EU-PI project, CIRCL developed a modular software[1], web service and API to review the security of URLs.
- Depending of the URL to review, it can be difficult to estimate a level of trust.
- URL Abuse includes a series of modules in order to review an URL.
- Then the various indicators can be used by the users (or an analyst) to determine the degree of trust.

[1] `https://github.com/CIRCL/url-abuse`

URL Abuse user-interface overview



Standing on the shoulders of existing data

- Degree of maliciousness of an Internet Service Provider using BGP Ranking[2].
- Historical view of DNS records from Passive DNS[3].
- Historical perspective of SSL certificate usage and trust (Passive SSL).
- Distance analysis of the submitted URLs with legitimate URLs.

[2] `http://bgpranking.circl.lu`

[3] `https://www.circl.lu/services/passive-dns/`

BGP Ranking - The benefit of sharing for innovation

- Project started in 2011 as a scientific experiment to rank the maliciousness of Internet Service and Hosting Provider.
- BGP Ranking project is fully open source including **a 4-years dataset of cyber security metrics** per ISP (BGP ASN).
- The project is an operational services used by various incident responders or Internet security services (e.g. URL Abuse in EU-PI).
- A recent paper from Georgia Tech, *ASwatch: An AS Reputation System to Expose Bulletproof Hosting ASes published at SIGCOMM '15.*
  - *Researchers created a new model and* **used CIRCL BGP Ranking to compare their improved model**.
  - *ASwatch research provides* **concrete improvements** *that will be used in CIRCL BGP Ranking.*

Contributions of users against cybercrime

- Attackers tend to localize more their attacks and focus on specific groups of potential targets.
- Having **localized information from potential victims** helps to analyse current threats, incidents and attackers behavior.
- Localized dataset (e.g. Passive DNS) helps to detect potential abused or "phished" services.
  - What are the most used web banking services in a country?
  - Can you build a golden list of URLs?
- EU-PI regionalized the submission of potential phishing links. The localized informatiom can support additional researches.

Conclusion

- Having **open data sharing** models helps researchers and private organizations to experiment.
- Providing **open source** software increases peer review and especially **reproducibility** of past experiments.
- Peta-scale datasets and privacy challenges is still an opportunity for improved **data-structure research**.
- Localized and expanded cyber security datasets sharing opportunities are still huge.

Contact

- info@circl.lu
- `https://www.circl.lu/`
- Security researchers? MSc and PhD opportunities - `https://www.circl.lu/projects/internships/`
- OpenPGP fingerprint: CA57 2205 C002 4E06 BA70 BE89 EAAD CFFC 22BD 4CD5