Computing in Context: Intelligence and Security Informatics

Module: Internet Reconnaissance – Accessing and Securing Private Data

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August 3, 2013

1. Module name

Internet Reconnaissance – Accessing and Securing Private Data

2. Scope

Students will learn how "Black Hats" use Google advanced searching techniques to find sensitive data on the Internet.

3. Learning objectives

- Using Google Advanced Search to search for sensitive data on the Internet using targeting parameters
- Using Google Custom Search API to automate searching for sensitive data on the Internet using targeting parameters
- Using knowledge of advanced search methods to secure one's own sites

4. Computing concepts and skills involved

- Social context, algorithms and problem solving, programming
- Knowledge representation and information retrieval
- Communications and networking, intellectual property rights

5. Level of effort required (in-class and out-of-class time required for students)

- In-class activities: Two regular classes, each 75-minutes long
- Out-of-class activities: Completion of course project developed in class

6. Relationships with other modules (flow between modules)

- N/A

7. Prerequisite knowledge/skills required (what the students need to know prior to beginning the module; completion optional; complete only if prerequisite knowledge/skills are *not* included in other modules)

- Use of personal computers and basic Internet searching
- Programming at CS1 level

8. Introductory remedial instruction (the body of knowledge to be taught for the prerequisite knowledge/skills required; completion optional)

- N/A

9. Body of knowledge (theory + practice; an outline that could be used as the basis for class lectures)

- Social Engineering: how low tech methods yield volumes of private data
- "Black hat" view of the Internet and easy access to advanced search techniques
- Fine art of using search engines (in particular Google) as a reconnaissance tool
- Programming the Google Search API

10. Resources (required readings for students; additional suggested readings for instructor and students)

- Google search directives explained (http://www.googleguide.com/advanced_operators_reference.html)
- Chapter 5: "*Counter Hack Reloaded: A Step-by-Step Guide to Computer Attacks and Effective Defenses*", by Ed Skoudis with Tom Liston, 2nd edition
- Google Custom Search API site: (https://developers.google.com/custom-search/v1/overview)
- The definitive PHP programming resource: (http://php.net)

11. Exercises / Learning activities

- Textbook and Google site readings
- In-class discussions
- In-class Google Advance Search exercises
- In-class and out-of-class code development in small groups
- In-class group presentations of accessed results

12. Evaluation of learning objective achievement (graded exercises or assignments)

- Code and presentation grading

13. Glossary

- Black Hat, Reconnaissance, Social Engineering
- Google Search Directives, Google Custom Search API, PHP

14. Additional useful links

15. Contributors (authors of module, reviewers of module)

- Daniel Plante