Proposed College Curriculum Changes for Producing Secure Developers

Christine Fossaceca
MIT Lincoln Laboratory
Lightning Talk
Who is the problem? The Hackers or the Programmers?

- Midyear Report July 2017
- 9,690 new vulnerabilities published
- 30% increase from last year
- BUFFER OVERFLOWS!!!!
I’m Not The First...Or The Second...Or the Third..

- **2010**: Bryant, Sutner, Stehlik, Carnegie Mellon Internal Paper
- **2014**: HOPE 2014 Sarah Zatko
- **2016**: HOPE 2016 Ming Chow and Roy Wattanasin
- **2017**: Today...
A look at Curriculums

- Top 100 Schools based on US News and World Report
- Chose to look at REQUIRED courses for a Computer Science major, and search for the word “security”
A look at Curriculums

- The good news: most of the schools had at least one course with the word “security” used.
- The bad news: Only 31% of schools required computer science students to take a course using the word “security”.
The word “security”

- This is a terrible metric that we unfortunately use

- Common information covered in courses using the word “security” in their description
  - Cryptography
  - Network protocol security
  - Privacy
  - Forensics
  - Laws and Policies
Why ABET?

- Accreditation Board for Engineering and Technology
  - Natural and Applied Sciences, Computing, Engineering

Conclusion: Most top tier schools have ABET Accreditation

US News and World Report ABET Accredited Schools by Category
Criteria for Accrediting Computing Programs

- Very vague requirement to talk about security at some point

(a) An ability to function effectively on teams to accomplish a common goal
(e) An understanding of professional, ethical, legal, security and social issues and responsibilities
(f) An ability to communicate effectively with a range of audiences
What Changes Should Happen?

- IEEE should push for a new requirement
- The ABET Commission meets annually to go over these ideas
- Preciseness of language in the standard, such as “correctness of code” instead of “security”
  - Instruction in secure coding practices
  - Education on known vulnerabilities
Thank you

Research
Leah Goggin, MIT
Elitza Neytcheva, UMass Amherst
Pedro Torres-Carrasquillo, MITLL
ABET Staff (Headquarters)

Review
Sarah Chmielewski, MITLL
Doug Stetson, MITLL
Bibliography


- ”Computer Science’s Curricula Failure-What do we do now?” Chow, Ming and Wattanasin, Roy. HOPE 2016