Think of the Children: Preparing the Next Generation of Security Specialists

Roman Bohuk Jake Smith Deep Run High School @RomanBohuk
@jtsmith282

Who are we??

- Students at Deep Run High School
- Little formal experience
- Organize our own CTF contest
- Met a lot of people
- Enjoy security topics



Jake Smith



@jtsmith282

- Discovered love for security ~3 years ago
- Project Management
 - + Security Focus
- Comp Sci, UVA 2021
- Interning at GE
 Digital this summer

- Computer Science & Mathematics
- Not limited to a single area of IT -> IoT & Cybersecurity
- Computer Science @
 UVA 2021

Roman Bohuk



@RomanBohuk

Topics for Discussion

- 1. How to help students get involved in security?
- 2. How to train the prospective developers to keep security in the back of their minds?
- 3. How to connect industry and government to students?

Agenda

- 1. Current landscape
- 2. The ideal IT guy
- 3. Current Programs
- 4. What can you do?



Cyber Cyber Cyber



What's happening now?

- Past Decade: IT.
- Latest Trend: IT becoming more specialized
 - App Dev / Web Dev
 - IT PM
 - Security
 - Networking
 - Hardware
 - Databases

Cybersecurity is NOW





Source: https://pbs.twimg.com/media/B5G8nuBCIAEDz54.png:large

Source: https://3.bp.blogspot.com/-j80kbLow6z0/UcRxbinqSI/AAAAAAAJ8Q/20YKoZiRg48/s1600/Yeah-well-thats-justlike-your-opinion-man.jpg

Problem Statement

Open jobs, undertrained workers, rising risks



How can we work to combat this problem? How does this interest translate into quality security programs and people?

Problems w/ Security Field

- Lack of exposure
- Seemingly high barrier of entry
- Complicated, Ongoing, Evolving
- Diverse Skillset Required

Problems w/ Security Field



Source: http://knowyourmeme.com/photos/438093computer-reaction-faces

The Ideal Security Person

- 1. Knows how things work instead of blindly using the tools
- 2. Curious and thinking outside the box
- 3. Stubborn (and knows how to Google)
- 4. Untrusting nature Paranoid
 - 1. Or at least trust, but verify
- 5. Good presentational skills
- 6. Thinks like a hacker (arguable)



How do students get there?

What is not taught?

- Students are taught specific ways to solve problems without explanations
- Little incentive to study outside the curriculum
- Almost no opportunities to learn cybersecurity topics without self-initiative



Problems

- Some things cannot be fixed
- Nevertheless, students learn programming and begin developing systems without any prior experience with security
- Relative cost to fix the problems increases

Problems



What is not taught?

- Even though computer science is still widely though to be under-taught, the schools are getting better
- Nevertheless, there are still almost no opportunities to study cybersecurity topics
- No emphasis on security

What is not taught?

- Even though computer science is still widely though to be under-taught, the schools are getting better
- Still almost no opportunities to study cybersecurity topics
- No emphasis on security in classes

Yet ...

- There are students who want to pursue the field
- They don't have any contacts to make the first step and reach out to infosec people



How can you help?

Professionals

- Find about computer clubs at local schools and volunteer to give presentations or mentor a team
- Come and volunteer at competitions to network with teachers and see what they need
- Bring students to events (conferences, CCDC)



Companies and Organizations

- Sponsor or host competitions
- Provide incentives for pursuing cybersecurity
- Spread the word, get others involved
- Internships
- Provide resources schools do not have the hardware
 - Donate retired hardware

Parents

- Show the dangers but don't be paranoid about it
- Encourage participation in competitions



Teachers

- Contact local organizations
- Start a cybersecurity or computer club
- Talk to other schools with more experience and participate in joint events

Benefits?

- Return on investment sustainable
- Rewarding personal satisfaction
- Learning opportunity learn from students yourself
- Lessons learned share the experiences

CyberPatriot

- Middle/High School
- Fixing security issues on given Windows or Linux images
- Benefits: Hands-on, Great
 Exposure, Popular
- Get involved?: Mentor!!!



Computer Club

- Different groups of students interested in IT and/or security
- Hands-on experience for students, ie. CTFs, Wargames, Instruction, Mentoring
- Get Involved?: Mentor, Guest Speaking

CTFs/Hackathons

- CTFs: Virtual Capture-the-flag
- Hackathons: Collaborative Solution Development
- Benefits:
 - Job Opportunities
 - Fun/Practice Skills
 - Recruitment
 - Community Involvement





MetaCTF

- Roman and I's CTF
- Held for Middle School to Industry
- Entry level to help spark interest
- Metactf.com



GhostRed

- Hackathon and CTF initiative started within GE
- Covering Middle School to Industry
- Held all over the country
- Continued exposure + opportunities = Success



CCDC

- College Level Blue Team Exercises
- Students defend against live Red Team of Industry Pros in simulated real world environment
- Very good hands-on practice
- Get Involved?: Mentor/Help

NATIONAL

CYBER

DEFENSE

COLLEGIATE

COMPETITION

Conferences

- Beginner to Expert Level
- Networking + Learning
- New Opportunities
- Get Involved?:

Encourage students

to attend





Source: https://pbs.twimg.com/profile_images/7 94271957818580992/QJo6URkq.jpg

Source: http://rvasec.com/wpcontent/uploads/2016/05/RVA5ec-Logo-Winner-2.png

Mentoring/Guest Speaking

- Extremely beneficial to student
- Unparalleled opportunity
- Time = Most Valuable
- Very Rewarding
- Also: Ethics
- Get Involved?: Mentor!



Challenges

- No initial interest
 - Bribes? (jk) Talk to teachers about extra credit.
- Students say it is not fun / boring
 - Well, its not for everyone
 - Maybe they don't yet have the necessary technical experience
 - Tell them hacker stories
- Students say it is too hard
 - Guide them to basic starter CTF competitions
 - Provide training material
- In any case, let us know how it goes. We might have more contacts with the schools teachers around the area.



The Students' Task

- Two Way Street
- Don't turn down the opportunities
- Take initiative
- Don't be shy





WE WANT YOU!

Source: http://www.supergrove.com/wp-content/uploads/2017/03/uncle-sam-i-want-you-meme-24-uncle-sam-i-want-you-clipart.jpg



contact@metactf.com