

RSA®Conference2018

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SESSION ID: PROF-W02

MEETING BUSINESS NEEDS BY FILLING THE CYBERSECURITY SKILLS GAP



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MODERATOR: **John Pescatore**

SANS, Director Emerging Security Trends
@John_Pescatore

PANELISTS: **Alan Paller**

Research Director
SANS Institute

James Lyne

Global Security Advisor
Sophos

Joseph Roundy

Cybersecurity Program Manager
Montgomery College (MD)

It Took Me a While, But I Began to Wonder...



Figure 1. Magic Quadrant for Endpoint Protection Platforms



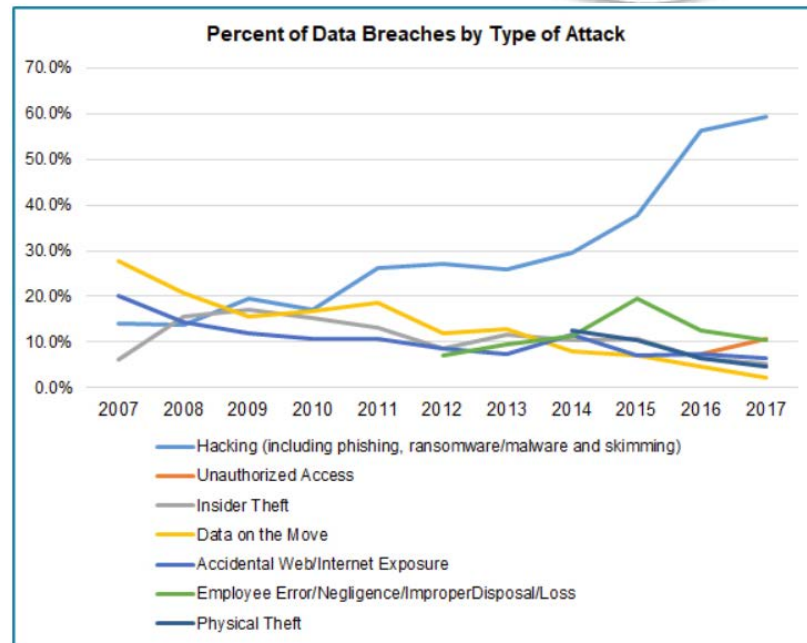
Table 5. Median Budget and Percentage Allocated to Security by Year by Industry			
Industry	IT Budget		
	FY 2014	FY 2015	FY 2016 (Projected)
Financial services	\$1M	\$500K-\$1M	\$500K-\$1M
Technology/IT services	\$100K	\$100K-\$500K	\$100K-\$500K
Government	\$500K-\$1M	\$500K-\$1M	\$1M-\$10M
Education	\$1M-\$10M	\$1M-\$10M	\$1M-\$10M
Health care	\$1M-\$10M	\$1M-\$10M	\$1M-\$10M
Industry	% Budget for Security		
	FY 2014	FY 2015	FY 2016 (Projected)
Financial services	7%-9%	7%-9%	10-12%
Technology/IT services	1%-3%	4%-6%	4%-6%
Government	4%-6%	4%-6%	7%-9%
Education	1%-3%	3%-4%	1%-3%
Health care	4%-6%	4%-6%	4%-6%

Source: SANS 2016

Why Do Some Do So Much Better Than Others?

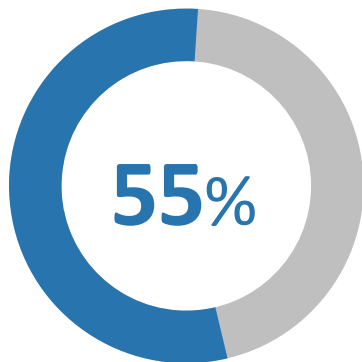


- 1579 breaches in 2017
 - What did the other 8,400 of the F10000 do differently?
 - (1091 in 2016)
- On average, 113K records exposed per breach
 - What did those who limited breach size do differently?
 - (Average = 33k in 2016)
- **Almost invariably, the organizations with the least cyber incident impact have the strongest CISOs and security teams.**



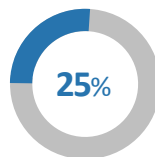
Source: Identity Theft Resource Center

The Gap is More About Quality than Quantity

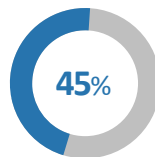


of respondents report that practical, hands-on experience is the most important cyber security qualification

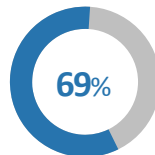
Source: ISACA 2017



of respondents say today's cyber security candidates are lacking in technical skills



of respondents don't believe most applicants understand the business of cyber security



of respondents indicate that their organizations typically require a security certification for open positions and most view certifications as equally, if not more, important as formal education

Questions for Our Panel



- **Is it possible to find young people with the DNA to become elite cyber pros, even if they don't think they qualify? - Alan Paller**
- **Can adults be found who will develop into cyber elite? How quickly can you develop them? What about those who have no IT backgrounds? - James Lyne**
- **What did you discover when you tried some of these ideas at Montgomery College (Maryland)? And where do you go next? – Joe Roundy**

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ALAN PALLER – SANS FINDING TALENT EARLY

CyberStart – The “Game”

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- **Finds talent** in young people – even those who **didn't think they were capable**.
- The game **delights** young people who are curious, **tenacious**, fast-learners
- The Field Manual, hints and search tips enable it to work everywhere, without onsite support – **non-techy schools / rural schools / kids at home**
- **Motivates an interest in cybersecurity** and STEM careers
- **Teaches the foundations of cybersecurity**



Evidence: Finds talent— even if they didn't think they were capable.

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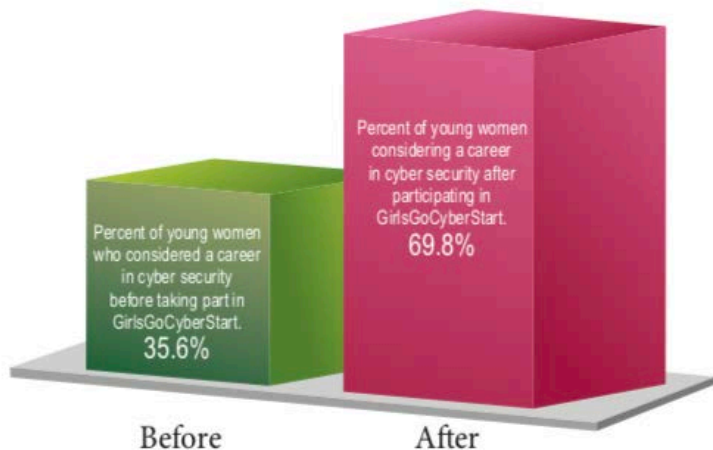
- I am a girl who has been put down many times for her “lack of skill” in a field dominated by boys. This game has given me the confidence to know that I know what I am doing and to be with other amazing young women who share my passion and interest for cyber security.
- Before I recruited girls to be a part of this wonderful program I struggled to get girls to realize they could be computer scientists. I had girls actually saying they were too stupid to do this until I said, “Just try it”. Some of my girls found out they were good at puzzles, some found out they liked programming. I now have girls asking our counselor about computer science degrees.

Motivates an interest in cybersecurity and STEM careers

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Key Finding: Girls' STEM Career Interest Doubled

GirlsGoCyberStart participation nearly doubled the proportion of high school girls (from 36% to 70%) interested in a STEM career in cyber security.



- Many of the girls at my school who participated in this contest are now interested in looking into cybersecurity for a career. This contest gave them the “why” and the “how to use this knowledge” that they needed to get them extremely excited about computer science.
- You have motivated me to pursue cybersecurity as a possible career and believe that I actually have a chance to succeed.

Delights tenacious, curious, fast-learners

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- Thanks for giving our students an opportunity to try something completely new and discover that they are smarter than they think. My students were completely engaged and requested that we work on Saturday because they were enjoying it so much. They would dig for hours and were thrilled when they solved a difficult problem. Several times they expressed that it was really fun and they really learned a lot.
- The final weekend of the challenge was the beginning of our school vacation week. Three of the four girls spent most of Saturday and Sunday in my classroom with me! There aren't too many things that would get high school students to sacrifice two days of vacation to work on education!

Rural schools / non-tech savvy schools

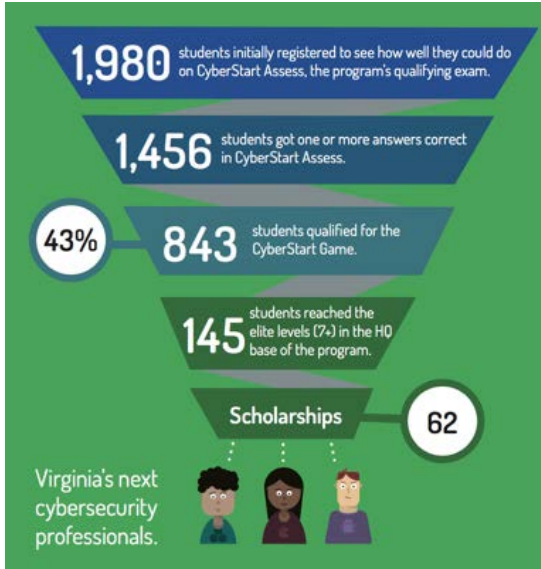
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- Thank you so very much. My students were able to participate in something they normally would have no knowledge of in our rural area. At first, they were unsure they could even figure any of it out. By the end, they were yelling and jumping up and down as they finished a challenging section and moved on to the next. They were so sad the time ran out on this experience.
- In my high school, there are rarely any opportunities like this where someone like me who knows nothing about cybersecurity gets to learn about it and love everything about it. I hope that an opportunity like this will come again to not only me, but all those who have been waiting for this golden opportunity in their lives.

Teaches the foundations of cybersecurity

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- The team from Padua Academy – Wilmington DE
- 7th ranked team out of 2,700 teams in 16 states
- Youngest player on the team at Women in CyberSecurity Conference in Chicago



91% of students who said they had not considered cyber as a career, said they would after having played CyberStart

College Students, too.

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- You can't imagine how much this helped me improve my skills in multiple programming languages, and understanding what cybersecurity really is. (Chioma Nwizu, College Freshman)
- This program taught me more than an entire semester in college (Ryan Nakata, College Junior)
- I learned how to reverse-engineer stripped binaries! (Iowa College Junior)
- This was amazing. Even as a 5th year computer science student I was learning new things. I especially liked how it encouraged you to do the research necessary to solve the problems: it didn't just teach you how to do everything. (Jordan Newton, George Mason University)

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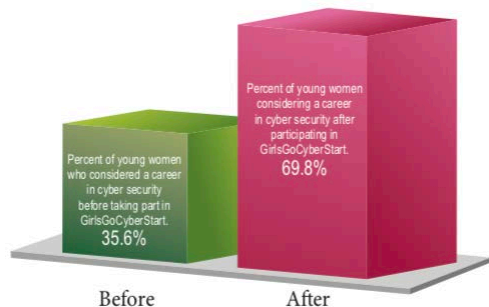
JAMES LYNE - SOPHOS

Thank You!

A big thank you note to Governor Hogan

Key Finding: Girls' STEM Career Interest Doubled

GirlsGoCyberStart participation nearly doubled the proportion of high school girls (from 36% to 70%) interested in a STEM career in cyber security.



Thank you for allowing girls in our state to have this exposure that we are not receiving in school. You have motivated me to pursue cybersecurity as a possible career and believe that I actually have a chance to succeed. You have motivated me to continue.

Thank you so much for this program! I am a girl who has been put down many times for her "lack of skill" in a field dominated by boys. This game has given me the confidence to know that I know what I am doing and to be with other amazing young women who share my passion and interest for cyber security. I am truly grateful to be a part of this game and to be given this opportunity to learn more! Thank you, thank you, THANK YOU! Thank you for showing us that we are capable of anything boys can do.

Before I recruited girls to be a part of this wonderful program I struggled to get girls to realize they could be computer scientists. I had girls actually saying they were too stupid to do this until I said, "Just try it". Some of my girls found out they were good at puzzles, some found out they liked programming. I now have girls asking our counselor about computer science degrees at our local community college.

You have motivated me to continue pursuing this as a possible career and believe that I actually have a chance to succeed.

Thank you for this opportunity. I had no idea what I wanted to do with my life and now I do thanks to this program.

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JOE ROUNDY – MONTGOMERY COLLEGE (MD)

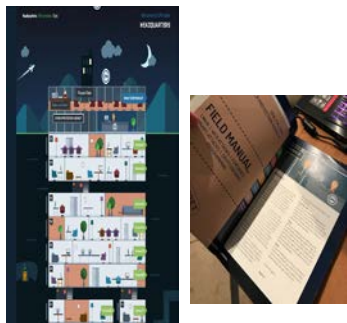
Montgomery College (MD) Pilot Program: Lessons Learned

Cyber Fast Track

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1

Used CyberStart
to select students



1. We invited Cybersecurity and Networking, degree seeking students to try CyberStart – 80 accepted the offer
2. Set eligibility score at level 6 and a minimum score of 12,000; 32* achieved that; 28 enrolled; 23 had/have A or B. *wanted more time!
3. Lesson 1: They were different from other students I teach.

Montgomery College (MD) Pilot Program: Lessons Learned



1

Used CyberStart
to select students



2

Taught CyberStart
Essentials Live

Category/Topic	Level
Linux	4
Windows	2
Computing	3
Networking	5
Programming	4
Common Attacks	4

1. 15 weeks – all five essentials - Fall'17 and Spring '18
2. Really challenging to teach all that in 15 weeks
3. Found online CyberStart Essentials (CSE) covered 40% more with built-in labs.
4. All my students now started CSE
5. Lesson 2: Even a skilled teacher won't benefit students by trying to cover all the Essentials.

January 17, 2018

Maryland State Government Announces EARN Grant



Cyber Fast Track

1. \$1.2 million in scholarships
2. Two SANS immersion courses – one in residential academy; one on-demand
3. Two corresponding GIAC certifications
4. Employer participation to maximize rapid placement with great employers
5. 10 of my students have already applied.
6. Lesson 3: Maryland is willing to invest in programs that put their most talented citizens into important, high-paid jobs.

4

Win Maryland EARN Scholarship for the Immersion Cyber Academy

- SANS immersion training and certification exams



- Proven for Veterans and Women

"Completing the SANS VetSuccess Academy not only influenced my career plans, it defined them. The education and certifications opened doors that were inaccessible to me otherwise, short of winning the lottery. In fact, being selected into the inaugural cohort was a "hitting the jackpot" moment for me." -Ed Russell, NTT Security, retired USAF SMSgt

MARYLAND CYBER FAST TRACK: MOVING TALENTED STUDENTS INTO IMPORTANT CYBER JOBS - FAST

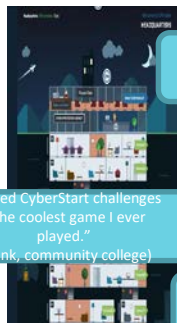
Free , open to all Maryland community college students



1

Discover if you like cyber

CyberStart: the Game



"The most fun I have had learning."
(Adam, community college freshman)

"I loved CyberStart challenges – the coolest game I ever played."
(Frank, community college)

"Taught me a lot and proved cybersecurity wasn't too hard to learn."
(Mariana, college sophomore)

2

Master the essentials

OPEN TO HIGH ACHIEVERS FROM THE GAME

CyberStart Essentials Course

Category/Topic	Level
Linux	4
Windows	2
Computing	3
Networking	5
Programming	4
Common Attacks	4

"This course helped make it possible for 51 people with no IT security experience to master more advanced cybersecurity courses and get good cyber jobs."
(UK Cyber Retraining Academy director)

"We now hire cyber people only if they have mastered the essentials. Without those skills they are useless in technical roles."
(CISO, multi \$billion Silicon Valley tech leader)

3

Demonstrate Maturity and Employment Readiness

CyberStart Interviews



4

Win Maryland EARN Scholarship for the Immersion Cyber Academy

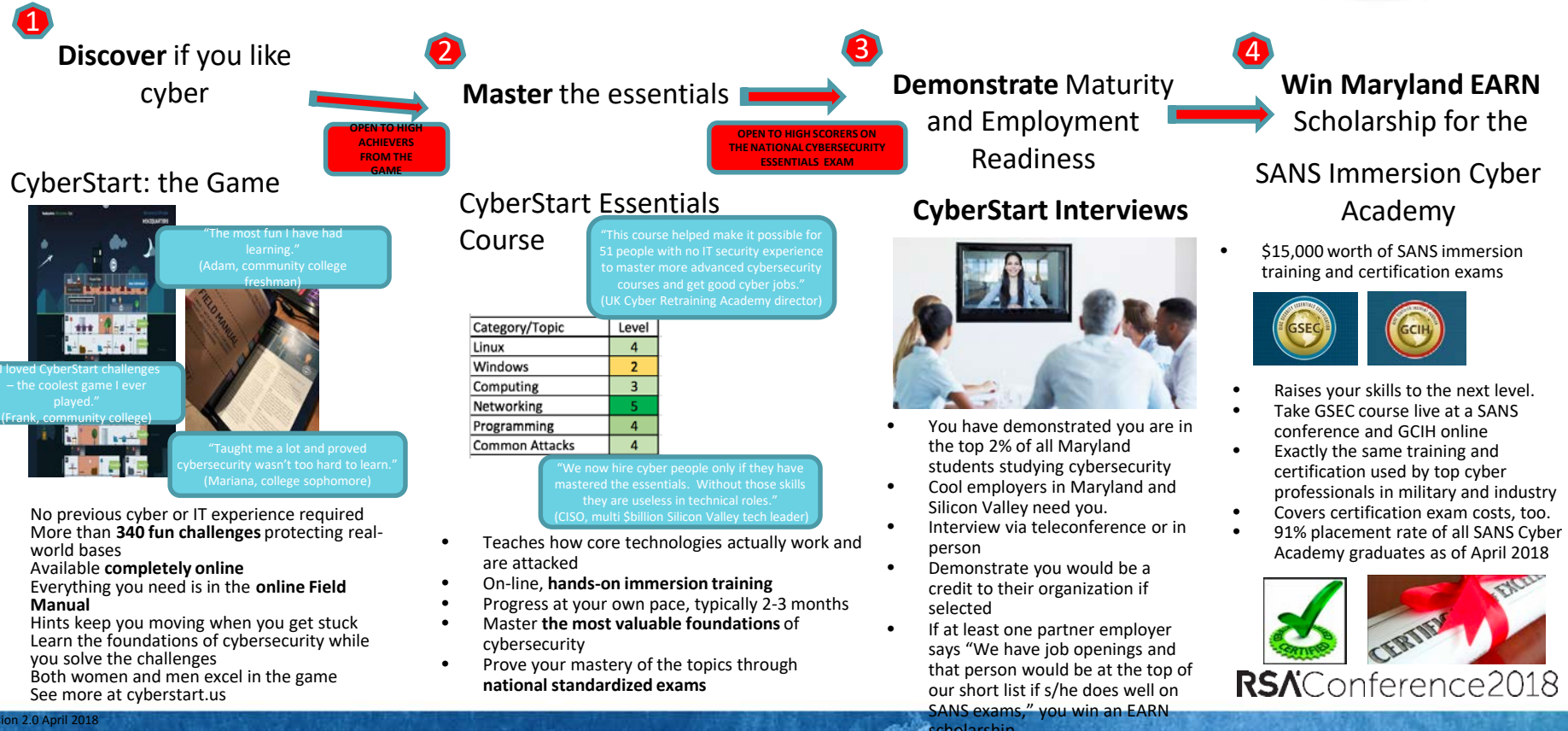
- \$15,000 worth of SANS immersion training and certification exams



A Maryland Cyber initiative supported by the SANS Institute

MARYLAND CYBER FAST TRACK: MOVING TALENTED STUDENTS INTO IMPORTANT CYBER JOBS - FAST

Free, open to all Maryland community college students





Resources

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- CyberStart - <https://www.sans.org/cyberstart>
- Vet Success - <https://www.sans.org/cybertalent/win-the-war-for-cybertalent>
- Montgomery College Cyberlab - <http://cms.montgomerycollege.edu/cyberlab/>
- NIST NICE Apprenticeship Working Group – <https://www.nist.gov/itl/applied-cybersecurity/nice/apprenticeship-sub-working-group>