

2017 Michigan NASCIO Award Nomination



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Project Title: Governor Snyder's High School Cyber Challenge

Category: Cybersecurity

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EXECUTIVE SUMMARY

In today's threat landscape, it's not a matter of if, but when a cyber-attack will occur. Every day, the State of Michigan detects tens of thousands of attempts to infiltrate its network. But what is equally concerning is the lack of talent to address the existing and emerging cyber threats. Michigan Governor Rick Snyder kicked off a high school cyber competition to prepare students for the workforce of the future, which many believe will rely heavily on science, technology, engineering and math (STEM) fields. Although the competition first started and ended in 2016, it has since become an annual event due to the interest and success of the program.

The Governor's High School Cyber Challenge (GHSCC) was created in partnership with Merit Network, a non-profit, member-owned organization governed by Michigan's public universities. Merit owns and operates America's longest-running regional research and education network. After 50 years of innovation, Merit continues to provide high-performance services to the educational communities and beyond.

The Michigan Cyber Range, powered by Merit Network, provided the scoring and online challenges, as well as conducted a virtual capture the flag exercise for the participating high school students. The high school teams, each comprised of three students, were asked to complete challenges designed to test their knowledge of information technology and cybersecurity in a two round state-wide competition. The GHSCC consisted of two rounds, the first held online. The second round took place at Governor Snyder's annual North American International Cyber Summit (NAICS).

94 teams (282 high school students) from 29 different schools participated in the GHSCC in 2016. The schools were geographically located across the upper and lower peninsulas of Michigan. The GHSCC was such a hit in 2016 that Michigan expects to have more than 200 registered teams in 2017. To accomplish this, Merit and the State of Michigan will execute a state-wide outreach campaign via emails, advertisements, press releases and other communications. In addition, Merit will host monthly online cyber mini-challenges from February 2017 to July 2017 to create additional excitement in the competition.

CONCEPT

The GHSCC (<https://www.merit.edu/cyberchallenge>) was created in 2016 as an effort to spark interest amongst high school students in cybersecurity and inform them of the work shortages the United States faces today. The program was designed to challenge high school students' skills in computer science, information technology and cybersecurity in a two round statewide competition. The competition consisted of two rounds, the first held online. The second round took place at the NAICS on October 17, 2016.

The Michigan Cyber Range, powered by Merit Network, provided the scoring and various online challenges, as well as conducted the capture the flag exercise during the NAICS. The participating high school teams consisted of three students per team. Each team was asked to complete the challenges to test their knowledge of information technology and cybersecurity. All high schools in Michigan were eligible to participate, and schools were permitted to enter more than one team.

Round one was held completely online. Michigan decided to conduct round one online in order to encourage and enable participation from all parts of the state, regardless of the economic status of the school or student. The challenges were focused on networks, programming, operating systems and hacking skills. The top ten teams then were selected to advance to the second round. To earn a spot in the second and final round, the teams competed online daily. Each day focused on a different topic, such as networking, programming, hacking and operating systems, and the challenges consisted of 20 multiple-choice questions. Round one was open-book style, in which students were encouraged to conduct research using the internet to answer the questions.

During the second round, participating teams competed in a virtual Capture The Flag exercise to test their skills with an intensive, timed series of cybersecurity challenges at the NAICS. This round consisted of the final 10 teams who emerged from the original 94 team competition. Finally, the top three teams of the second round received awards directly from Governor Snyder during lunch at the NAICS.

SIGNIFICANCE

The United States is facing a workforce shortage of more than 1.5 million security professionals worldwide within the next two years. Michigan faces challenges with the cybersecurity of our businesses and, most importantly, economic and talent development for our state overall. The GHSCC aims to generate student interest in the IT security fields and eventually build a workforce to meet the exponentially growing demand for cyber professionals.

Michigan's hope is that the GHSCC will be the first step, with the Regional Cybersecurity Education Collaboration (RCEC) being the second step. Both initiatives are designed to create a prosperous cybersecurity ecosystem, which exposes high school and college students to the IT field and helps them through their college education and certification, and then into the workforce through the RCEC.

Much like the GHSCC, the RCEC is another initiative intended to build a cyber-focused workforce. The vision of the RCEC program is collaboration between the higher education community and key private sector partners to address the widening gap between the supply of skilled cybersecurity professionals and the demand for those critical skills. The overall goal is to provide a robust cybersecurity curriculum to institutions throughout Michigan via a mix of face-to-face and distance learning courses at 2-year and 4-year colleges. To date, Central Michigan, Northern Michigan and Wayne State Universities have agreed to be the pilot colleges for this program. Additional information on the RCEC can be found here: <https://www.merit.edu/cybered>.

With the GHSCC established and the RCEC beginning courses in 2017, Michigan believes they've created a unique educational infrastructure that generates students' interest in technology careers and solving some of the existing talent shortfalls.

IMPACT

It's difficult for Michigan to evaluate how the GHSCC has impacted the current cybersecurity workforce shortage because it's too early to determine, but it's also hard to overstate how excited these students were to participate in this competition. Think about it, the students who participated in the second round of the GHSCC weren't sitting in a classroom listening to a guidance counselor speak about the opportunities that exist in the cybersecurity field. Instead, they attended Gov. Snyder's annual North American International Cyber Summit and interacted with Michigan's Governor, state CIOs, military generals, and other subject matter experts within the public and private sectors. The State of Michigan, in partnership with Merit, believed that it was critically important to hold the second round at the summit, because we wanted the students to learn first-

hand how valuable these skills are and what opportunities exist within the cybersecurity field today.

The GHSCC had a tremendous impact within the State of Michigan. Specifically, 94 teams (282 high school students) from 29 different schools participated in the GHSCC in 2016. The schools were geographically located across the upper and lower peninsulas of Michigan. The following schools won and participated in the 2016 competition:

Winners

- 1st Place: Clinton High School – Clinton, MI
- 2nd Place: Airport High School – Carleton, MI
- 3rd Place: Cadillac High School – Cadillac, MI

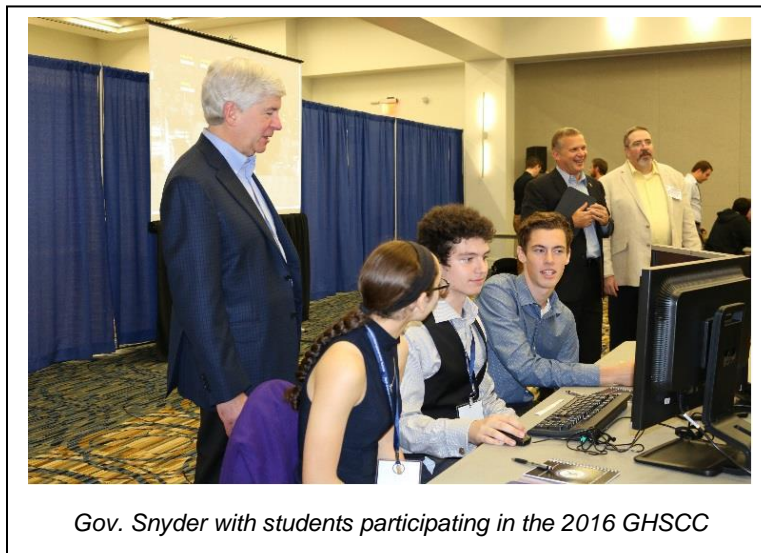
Other Participating Schools

- Airport High School – Carleton, MI
- Ann Arbor Huron High School – Ann Arbor, MI
- Ashley High School – Ashley, MI
- Bad Axe High School – Bad Axe, MI
- Bath High School – Bath Twp., MI
- Blended Learning Academies – Lansing, MI
- Bridgeport High School – Bridgeport, MI
- Buchanan High School – Buchanan, MI
- Cadillac High School – Cadillac, MI
- Caledonia High School – Caledonia, MI
- Capital Area Career Center – Mason, MI
- Clinton High School – Clinton, MI
- Frontier International Academy – Detroit, MI
- Genesee Career Institute – Flint, MI
- Greenville High School – Satterlee School – Greenville, MI
- Gull Lake High School – Richland, MI
- Heartlands Institute of Technology – Ionia, MI
- Kalamazoo Area Math & Science Center – Kalamazoo, MI
- Lapeer County Education & Technology Center – Attica, MI



Gov. Snyder with the winning team from Clinton High School

Lowell High School – Lowell, MI
Manchester High School – Manchester, MI
Marquette Senior High School – Marquette, MI
Michigan Virtual School – Lansing, MI
New Buffalo High School – New Buffalo, MI
Ovid-Elsie High School – Elsie, MI
Pentwater Public Schools – Pentwater, MI
University Prep Science & Math High School – Detroit, MI
Westwood High School – Ishpeming, MI



Gov. Snyder with students participating in the 2016 GHSCC

The Clinton High School teacher/coach made the following remarks related to the Governor’s High School Cyber completion:

“The Governor’s High School Cyber Challenge provided a great opportunity for all of my students to measure their knowledge of networks and security through a fun and engaging competition. My students vary in their background and knowledge of computer operating systems, websites, and protecting personal data online, but all of them were able to find the experience valuable and informative. I think the real value for my students was to see how vital cybersecurity is when so much of their day-to-day life is spent online. This event is responsible for a few of my students even considering going into cybersecurity for their future profession. I would recommend this challenge for any student because it is designed to start at an elementary level and progresses to levels that will provide challenge to even the most advanced student.”

Michigan was extremely excited with the turnout of the first cyber competition in 2016, but the goal for next year's GHSCC is to make it bigger and better with more teams across Michigan competing in the event. To date, Michigan is on pace to double the number of participating teams/students in 2017.