2024 CyberBoat Challenge

brought to you by the Maritime Cybersecurity Institute[1]

Event Specifics

Dates: 16-18 December 2024 (Travel on 15 Dec and 19 Dec)

Location: The University of South Carolina – Beaufort (USCB), 1100 Boundary Rd, Beaufort, SC 29902

Cost: Attendance at the CyberBoat Challenge is free, but attendees are responsible for their own travel.

Attendees

- College students interested in maritime cybersecurity are invited to register and attend.
- Professionals in the maritime industry are encouraged to attend, sponsor, and mentor during the event.
- Security professionals interested in embedded networked systems used in recreational and commercial marine systems are invited to teach and mentor students.
- Government representatives responsible for cybersecurity policies, procedures, enforcement, and training for maritime are welcome.

Interested individuals should sign up by October 15, 2024 on the CyberBoat Challenge Registration page https://forms.office.com/r/G85fkP9axP so the organizers can complete plans for food and accommodations during the event. All participants are responsible for arranging their own transportation and lodging.

What to Expect at the CyberBoat Challenge

The CyberBoat Challenge will be a fast-paced, rigorous and exciting event. There are two phases: 1) hands-on learning about marine systems and security, 2) free-form, mentor guided assessments of maritime systems. Sponsors and organizers will bring marine systems to use in demonstrations and assessments. Attendees will also have access to a boat on the water at the public docks.

Tentative Schedule

Monday, 16 Dec 2024	
0800	Introductions and Welcome
0830	Overview of Marine Systems
1000	Introduction to J1939 and NMEA2000
1200	Lunch
1300	Automated Identification System
1500	Wireless Systems
1800	Dinner
1900	Case Studies
2100	Venue Closed

Tuesday, 17 Dec 2024	
0800	National Marine Electronics Association
0830	OneNet - IPv6 for Marine Systems
1000	Applied Cryptography
1200	Lunch
1300	Assessment Preparation
1330	Mentor Guided Assessments
1800	Dinner
1900	Assessments
2200	Venue Closed

Wednesday, 18 Dec 2024	
0800	Assessments
1200	Lunch
1300	Assessment Presentation Preparation
1500	Student Presentation of Results
1800	Dinner with concluding remarks
2000	Venue Closed

[1] https://www.mcsi.org/

The CyberBoat Challenge Mission

Develop the **talent** needed for the next generation workforce by bringing awareness, excitement, professional involvement, and practicum-based training to the maritime cyber domain.

Establish a **community** of interest for maritime cybersecurity that transcends companies or departments and reaches across disciplines and organizations for a more experienced base of engineers and managers.

About the CyberBoat Challenge

Cybersecurity issues are closely guarded secrets today and discussions about cybersecurity posture or vulnerabilities rank in the core concerns of any organization. Yet, given the nature of our interconnected world and the ubiquity of processing power and storage power in even the most mundane of products (e.g. new toasters, refrigerators, door bells, and thermostats) understanding security posture, issues, and remediation are critical to our society.

While progress in data sharing is being made through the various ISACs (Information Sharing and Analytics Centers), too little is being done to energize and encourage discourse among the engineers, and too little is being done to help prepare and develop the next generation workforce – to develop their skills, provide them with a network of potential mentors, and excite their interest in transportation sector cybersecurity. The CyberBoat Challenge attempts to remedy this.

This event is committedly pro-industry, and all its actions, efforts, and outreach is to help industry understand and eventually conquer cybersecurity challenges. It is a resource for participants to draw on in terms of education, in terms of connections, in terms of understanding the needs and priorities and remedies of sister organizations, in terms of understanding the government perspective, and lastly as a recruitment resource for HR's arsenal of tools.

CyberBoat Challenge Vision Statement

Ubiquitous, reliable, safe, and cost-effective transportation is key to our way of life and a prime ingredient of the American lifestyle. The CyberBoat Challenge, along with its sponsors, believe the cybersecurity of the transportation domain – whether ships, boats, cars, trucks, planes or heavy equipment – is at the core of an important new industry and discipline. The CyberBoat Challenge teaches techniques and understanding of this domain, and also helps facilitate collaboration among industry, academia, the research community, and government. This event will be strongly pro-industry and seek to provide understanding, tools, and highly useful resources to help manufactures, designers, and suppliers master the cybersecurity domain and create progressively superior products.

Students learning about maritime cybersecurity at the 2022 Cyber Boat Challenge in Houghton, MI

Sponsorship Opportunities

Running a world-class event, like the CyberBoat Challenge, requires resources. These include student travel subsidies, instructor compensation, catering, equipment and supplies, shipping, promotional materials, rentals, and event support. We seek tax-deductible contributions at the following levels:

Level	Benefits
Premier $>=30,000	• Recognition as Premier Sponsor in both the naming of the event ("brought to you by") and in all collateral, descriptions, promotional materials, etc. • Provided reasonable "slots" for attendees at the event. • Have a 30-minute speaking slot during the introduction and commencement on the initial day(s) • Have an area to set up static displays and tables for promotional materials • Have the opportunity to engage students and professionals at the event and have HR contact (if desired) with students during scheduled breaks/downtime • Invitations for staff visits during class hours • Participants have access and hacking sessions during the assessment days • Logo and/or name will be included in the year's event logo and will be on all promotional material and collateral (e.g. t-shirts and coins as well as briefing material) • Recognition on the Challenge website as Premium Sponsor • Recognition and "headline position" on the sponsor appreciate signage • Premium Sponsor will receive a copy of the attendee list and a list of all sponsoring entities (except those who sponsor on the pre-condition of anonymity)
Platinum $25,000	• Dedicated vendor booth space will be available for the sponsor • Large sponsor logos will be included prominently on the CyberBoat Challenge logo for this year • Large sponsor logos will be printed on banners, signs, name tags, and other promotional material • One of the catered meals will be attributed to the sponsor • Sponsor will be scheduled a short speaking slot to address the Challenge • Sponsor can bring any reasonable number of personnel to the event
Gold $10,000	• Dedicated vendor booth space will be available for the sponsor • Medium sponsor logos will be included prominently on the CyberBoat Challenge logo for this year's event • Medium sponsor logos will be printed on banners, and signs • Can bring up to 5 people to participate in the event
Silver $5000	• Dedicated vendor booth space will be available for the sponsor • Small sponsor logos will be included prominently on the CyberBoat Challenge logo for this year's event • Can bring up to 2 engineers to participate in the event.

In-Kind Donations

Companies that cannot sponsor with cash donations can still sponsor with useful in-kind donations to assist the event. This could be in the form of a vehicle, electronic control modules, and software. Written receipts will be provided for cash contributions only. Companies providing in-kind support will be responsible for their own record keeping. Logo placement and vendor booth space is not available for non-cash sponsors.

Premium Sponsor with Naming Rights

The Board of Directors of the CyberBoat Challenge will reserve the opportunity for one entity to be a premium named sponsor for the event. If you are interested in being a premium sponsor at a level significantly higher than the Platinum level, please contact one of the organizers.

Opt-out of Named Recognition

By default, sponsors will be recognized by the CyberBoat Challenge and your company name and logo may be included or referenced in promoting the Challenge. However, any sponsor can opt-out of named recognition. To opt-out, please send a written request to the organizers.

Contact Information

The CyberBoat Challenge is a Michigan-based 501(c)3 non-profit designated as an educational organization. All donations are tax deductible.
If you are interested in

Jeremy.daily@colostate.edu
karl.heimer@outlook.com

CyberBoat Challenge Participation

Participation at the CyberBoat Challenge is by invitation only and requires participants and visitors to sign a non-disclosure agreement. There are four categories of participants: 1) Students, 2) Industry, 3) Government, and 4) Security Research Mentors. (Speakers and Instructors are also participants.)

- Students must apply to attend the CyberBoat Challenge that will be reviewed and approved by the CyberBoat Challenge Board of Advisors. Faculty must recommend the student.
- Industry participants must demonstrate some level of sponsorship to attend as a participant.
- Government employees and contractors may participate provided they contribute to the mission of the CyberBoat Challenge.
- Security Researchers will be invited to attend and provide mentorship for students based on referrals and professional accomplishments. Please contact the organizers for more details.

All participants and visitors are responsible for their own travel expenses unless you are a student (to whom we may offer partial reimbursement or travel stipend).

Benefits of Participation

The success of the CyberBoat Challenge demonstrates the following benefits:

- Establish relationships within the community and understand resources outside your company.
- Scout student talent that will build the capabilities of your engineering teams.
- Position your company at the forefront of the industry in addressing cyber-security issues.
- Help fill the talent gap of qualified engineers capable of addressing cyber-security challenges.

We encourage sponsor engineers to participate in the full week's activities. This maximizes the engagement opportunities and helps forge bonds with the students (future colleagues).

Frequently Asked Questions

1.) Q: Who comes to this event?

A: Industry, both the OEMs and the supplier community, government engineers and managers, college students, academic researchers, and hackers.

2.) Q: Hackers? You mean you actually have people try to hack the systems?

A: Yes. There are many ways to use the term "hackers" – and not all of them are the "bad guys" – as a society we use researchers and ethical hackers to evaluate banks, hospitals, government organizations, large corporations, the power grid, and almost everything else. In today's world it is increasingly difficult to find any "thing" that doesn't have communications with something else and which doesn't have a computer in it. It is normal to have specialists who review the security of systems and components to look at this system, too. Here at the CyberBoat Challenge we used ethical hackers from major companies and some well-known within academia to provide the perspective and model the actions that a "bad guy" hacker would when faced with assessing the systems.

3.) Q: But, aren't you worried that they will find something?

A: Succinctly, no. Code evaluations and security evaluations are now mainstream in most industries. We have NDAs and legal protection in place, and all the "hackers" are from professional security firms with significant experience and who are accustomed to providing confidentiality regarding their work. Should anything be found, it would be protected information and would go to the equipment manufacturer who could then take appropriate action with respect to patching or development cycle changes.

4.) Q: Why are you doing this – or at least why now?

A: Now is the perfect time to do this. Now gives us a chance to address the immense technological changes coming to the industry and proactively plan for how to implement them and secure them. We think it is best to look down the road and be ready for changes rather than responding to them. By helping develop the next generation workforce – running this event for college students – and talking about real and intended technological changes we are creating the underlying capability to do something about potential future vulnerabilities. We believe this is a much better approach than waiting until an urgent response is needed for an unplanned and possibly surprising event.

5.) Q: Can you describe the training involved in this event?

A: There are several classes over a two-day period including hardware reverse engineering, software reverse engineering, systems reverse engineering, component analysis, fundamentals of bus or other on-board network architecture and communications, fundamentals of the communications protocols used by these systems, and then some shorter demos and classes. We also spend time up front and at the course conclusion talking about the NDA and their legal, ethical, and moral responsibilities. After the two days of classes, we have a one-day guided assessment exercise in which the teams get to know the system they are assigned. Following the initial event, some students will be invited to participate on an assessment of a larger craft – ship. Details on this second level assessment will be provided to selectees.

6.) Q: The coursework sounds very attack focused. Is this, then, primarily an attack-centered event?

A: It is intended to introduce how an attacker thinks and acts. Hackers tend to think differently than developers. Developers tend to ask themselves "how can I make this work". Hackers tend to ask themselves "how can I break this" or "how can I make this perform in an unintended way"? This means the minds engaged in cybersecurity tend to look at the world differently from and function differently from standard developers. There is real value to industry in this approach and making it accessible. Think of a football team – if you only practice defense, you might not understand how the offence will work and you might not cover the same spots on the field as you would if you had skirmishes with an offensive line (and the converse is also true). This provides a different point of view to consider during the development and life-cycle maintenance activities.

7.) Q: You mention teams – what do the teams look like?

A: Teams are composed of college students, industry professionals (primarily engineers from OEM and suppliers, but perhaps an occasional technical manager, too), technicians, government (both engineers and some technical managers), and hackers.

8.) Q: How do you know this event is a good idea?

A: It is modeled after and designed by the same people who founded the CyberAuto Challenge (www.cyberauto-challenge.org), CyberTractor Challenge (www.cybertractorchallenge.org), CyberMedical Challenge (https://www.cybermedicalchallenge.org) and the CyberTruck Challenge (www.cybertruckchallenge.org) which are strongly supported by their respective industries as an educational and recruitment asset.