International Cybersecurity Exercise

SUCCESSES AND LESSONS LEARNED

February 2024
Iowa State University

Photo by Innovation Centre Kosovo

INTRODUCTION

Iowa State University and the Iowa National Guard hosted the third International Cybersecurity Exercise with the Kosovo Security Forces and collegiate students in Kosovo on February 24, 2024.

The exercise included teams made up of multiple high school and collegiate students from Iowa, surrounding U.S. states, and several institutions in Kosovo, including teams from Northern Macedonia and Albania. Students played in their home country with the technical support of the Guard and Iowa State.

This year's scenario was defending a power grid. Leading up to the event, students designed and built their team's defense network and defended against active adversaries—all in a real- time, safe, virtual environment. The day of the event was a eight hour defense phase, followed by a debrief.

The event was a great success. This report will outline successes and lessons learned, as we will continue to host the event in the future.

Photo by Innovation Centre Kosovo

TEAMS

30 teams participated in the exercise. Teams competed on the Iowa State University campus, on the University of Pristina campus, and virtually. Here are the groups that participated:

Institution	Location
University of Prishtina	Kosovo
University "Kadri Zeka"- Gjilan	Kosovo
University of Prizren	Kosovo
University of Mitrovica "Isa Boletini"	Kosovo
Haxhi Zeka University	Kosovo
UBT College	Kosovo
RIT Kosovo	Kosovo
AAB College	Kosovo
Universum International College	Kosovo
Cacttus Education	Kosovo
PBC Academy	Kosovo
ITBM Group	Kosovo
University of Tirana	Albania
South East European University	Northern Macedonia
Iowa State University	Iowa
Waterloo Career Center	Iowa
Urbandale High School	Iowa
Des Moines Central High School	Iowa
Hawkeye Community College	Iowa
Kirkwood Community College	Iowa
Des Moines Area Community College	Iowa
University of Northern Iowa	Iowa
Kansas State University	Kansas
The University of Kansas	Kansas
DePaul University	Illinois

SUCCESSES

Overall, the event was a success.

We received the below feedback among several conversations with faculty—both in Kosovo and Iowa—planning staff and students:

- Great learning and collaborative experience for students and all involved.
- Interest from students in participating again.
- Technology and infrastructure was useful and purposeful.
- The exercise mirrored real-world scenarios, further emphasizing the importance of engagement in solving activities.
- Established the tradition of organization among the faculty in Kosovo and other areas.
- We extended the duration of the exercise, this allowed for a more successful competition.
- Changing the day of the event to a Saturday in February allowed our students and staff more time to plan before and during the event and we were able to find more red team players.

LESSONS LEARNED

The event's success does not mean there was nothing we would change for a future event. There were some communication issues and trouble with the anomalies during the event. Our team is working together to resolve these issues for next year.

COMMUNICATION

- Increase response time from the team in Iowa, especially white team during the competition.
- Allow 4 weeks or more ahead of time to work, and the scenario needs to be released 4 weeks ahead of time.
- Determine how to utilize ChatGPT during the competition.
- Have Twitch accounts up and ready before the competition.
- Possibly incorporate a grading chart to show teams what they might have missed.
- Make sure teams have a clear understanding of rules.
- We would like to change the name to be the International Cyber Defense Challenge instead.

NEXT YEAR

There is interest in holding another challenge next year and possibly expanding the other countries in the Adriatic region. Iowa State University's ISEAGE team provided the cyber range for the 2024 competition and would be happy to provide it again for 2025.

The current cyber range will be opened to students three weeks prior to the event. During this three-week period, teams will actively build and set up their network relevant to the provided scenario. We can expect an increase in the number of teams participating in 2025 as in 2024, based on interest. We are planning on involving the National Guard units from the states that partner with the other countries in the Adriatic region that will participate in 2025.

As we plan the event for 2025, we will work to incorporate the lessons learned to improve communication and scheduling.

OPPORTUNITIES FOR GROWTH

Creating an entirely separate cyber range would provide Kosovo students the opportunity to practice and learn outside of the competition. Since there is currently no cyber range in Kosovo, a dedicated cyber range to Kosovo students would be a great learning opportunity for them.

Using Iowa State's current infrastructure, it costs Iowa State University about $5,000 for the event. This included hat production, trophies for first-, second-, and third-place winners and participants, and breakfast and lunch. This does not include the cost to fly the National Guard team to Kosovo, the cost to ship the hats and trophies to Kosovo, the cost to feed students and staff in Kosovo, and any other costs that the National Guard may have had.

Creating a new cyber range for students would have several benefits:
- Possibility for Kosovo students to access a cyber range and practice year round.
- Scalable so that other countries could participate in the event. This would be another way to engage other US states and countries around the world and, therefore, reinforce the National Guard State Partnership Program.
- Building a new cyber range would require another staff member. This staff member would be dedicated to developing and supporting the cyber range and its purpose. Specifically, this staff member—a graduate student—would also have a year to design and build a relevant, unique scenario.
- Allow for a cyber-physical exercise (power grid, water, transportation, etc.).

A new cyber range and support staff would require additional external resources.

ACKNOWLEDGEMENTS

We would like to extend our appreciation to several parties that made this event possible. Several months of planning went into this exercise, and it is because of the support from many teams and individuals that this event was a great success.

- Dr. Doug Jacobson, Iowa State University
- Iowa Army National Guard
- 168th Cyber Operations Squadron, Iowa Air National Guard
- ISEAGE, Iowa State University
- Kosovo Security Forces
- University of Pristina
- Kosovo faculty, educators and students

2024 Scenario Video

Thank you for your support and contribution to student learning in cybersecurity.

Photo by Innovation Centre Kosovo

Contact

Center for Cybersecurity Innovation & Outreach
Iowa State University
www.cyio.iastate.edu
cyio@iastate.edu