

International Cybersecurity Exercise

SUCCESSES AND LESSONS LEARNED

May 2023

Iowa State University



Photo by Innovation Centre Kosovo

INTRODUCTION

Iowa State University and the Iowa National Guard hosted the second International Cybersecurity Exercise with the Kosovo Security Forces and collegiate students in Kosovo on May 22, 2023.

The exercise included teams from Kirkwood Community College, Waterloo Career Center, multiple high school teams from Iowa, and several institutions in Kosovo. Students played in their home country with the technical support of the Guard and Iowa State.

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 six-hour defense phase, followed by a debrief.

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



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TEAMS

14 teams of students participated in the exercise. The Iowa National Guard and Kosovo Security Forces also each provided one team to participate, but neither teams were included in the rankings. Of the 16 teams, 6 teams competed on the Iowa State University campus, and 10 teams competed on the University of Prishtina campus. Here are the teams:

Institution

Location

University of Prishtina	Kosovo
University of Prishtina	Kosovo
UBT College	Kosovo
University of Prizren	Kosovo
Universum International College	Kosovo
University “Kadri Zeka”- Gjilan	Kosovo
Cactus Education	Kosovo
PBC Academy	Kosovo
Pleasant Valley High School	Iowa
Waterloo Career Center	Iowa
Kirkwood Community College	Iowa
Cedar Rapids Area Homeschool	Iowa
Urbandale High School	Iowa
Des Moines Central High School	Iowa

SUCCESSSES

Overall, the event was a success, especially for only being the second time this has been held.

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

- Great learning experience for students and all involved.
- The exercise and use of the cyber range was unique and valuable to Kosovo and all players.
- Interest from students in participating again.
- Technology and infrastructure was useful and purposeful.
- Students were recognized for their work and effort.
- The exercise mirrored real-world scenarios, further emphasizing the importance of engagement in solving activities.
- Establish the tradition of organization among the faculty in Kosovo.



Photo by Innovation Centre Kosovo

LESSONS LEARNED

The event's success does not mean there was nothing we would change for a future event. There were some technological, connection, and/or bandwidth issues during the event. Our team is working together to resolve these issues for next year and to make sure technology needs are met in Kosovo. We will also be re-evaluating how to draw in more people for the Red Team.

COMMUNICATION

- Delegate responsibilities to Kosovo faculty, mentors and hosts—including communication before, during, and after the competition.
- Increase response time from the team in Iowa.
- Allow 4 weeks or more ahead of time to work, and the scenario needs to be released 4 weeks ahead of time.
- Implement having Discord up and available.
- 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.

SCHEDULING

- Create a timeline or list of milestones that need to be completed by a specific date leading up to the day of the event.
- The duration of the event needs to be longer.
- Discuss changing the date of this CDC to replace Iowa State's National CDC held in February.
- Discuss changing the day to a Saturday, having the competition on a weekday makes finding red team players extremely challenging.

NEXT YEAR



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There has been great interest in hosting an international cybersecurity exercise next year.

Iowa State University's ISEAGE team provided the cyber range for the 2023 competition and would be happy to provide it again for 2024.

The current cyber range will be opened to students in Kosovo 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 the same number of teams participating in 2024 as in 2023, based on the capacity of the current cyber range. As we plan the event for 2024, 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 t-shirt 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 t-shirts 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.).

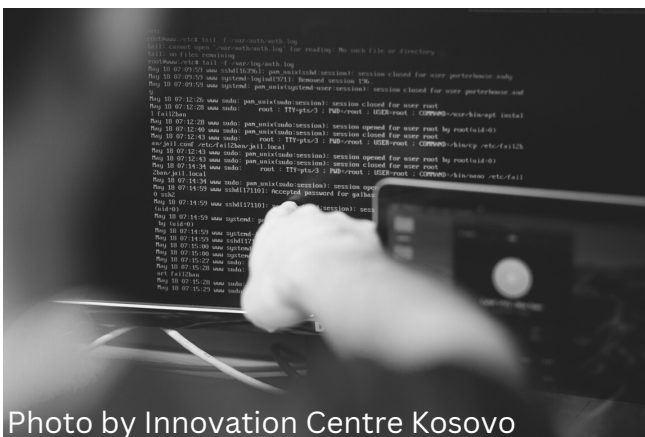
***A new cyber range and support staff
would require additional external
resources.***

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

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



Contact

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