ENFOCOM CYBERSECURITY

Security Training & Education

Specialized Hands-on Training And Education Is Required For Cybersecurity Professionals To Be Effective

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Case Study

Partner

University of Calgary

Business Need

Specialized hands-on training

Solutions

The ENFOCOM Cyber Range with various scenario simulations

Results

Instructors to spend more time teaching

Engage students with realistic customized training scenarios

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The Challenge

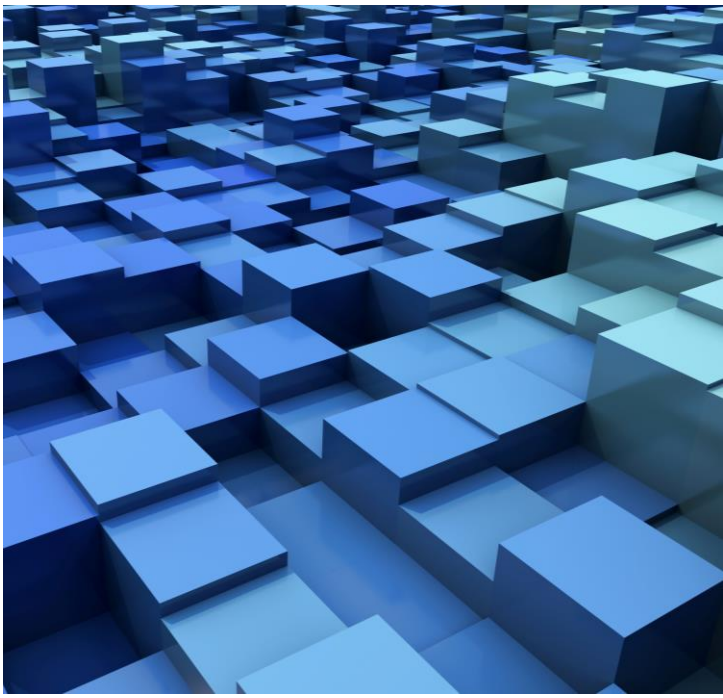
Experiential Learning

Given the growing demand for cybersecurity specialists across various industries, many universities strive to become prime destinations for information security and privacy training and education.

It has been long recognized that for cybersecurity professionals to be effective, they require hands-on and specialized training and education. Consequently, for universities, this means not only growing their teaching capacities but also adjusting the existing teaching methods and materials.

The specialized hands-on training required for cybersecurity professionals has also been recognized as an efficient learning methodology across various other disciplines and is often referred to as experiential learning.

At high-level, experiential learning is an education technique in which students are actively involved in the learning exercises to help them learn through gained experience. The recognized benefits of experiential learning include an increased pace of learning, the ability to immediately apply knowledge in practice, in-depth understanding and experience of the topic and many others.



As a result, there is a recognized need for training activities and environments that can support various scenario simulations and emulations, enhanced with concrete guidance, procedures, and tools.

One university striving to become the prime cybersecurity destination is the University of Calgary. In 2020 University of Calgary Faculty of Science introduced its new Master in Information Security and Privacy (MISP) professional graduate degree.

The degree is designed to assist IT professionals in transitioning into the growing cybersecurity market. With an emphasis on real-world scenarios, the university recognized that several challenges needed to be overcome for deploying the new degree program.

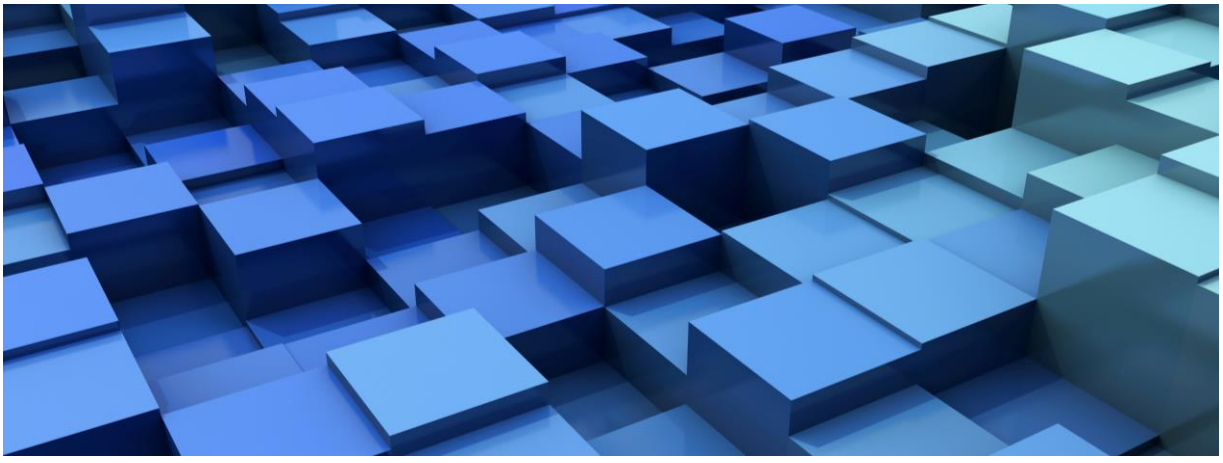
The Challenge

Scaling Systems Efficiently Continues To Be An Issue

These challenges included repurposing existing materials with a focus on experiential learning and transitioning from traditional learning methods that relied on static materials to dynamic real-time interactive systems. However, deploying such systems efficiently, at a scale and without requiring a lot of time from teaching and IT staff, was a tall order to achieve.

An example of the difficulty that teaching staff encounter when devising new teaching materials using traditional methods includes developing a component for a training program which commonly requires an instructor and/or teaching assistant to manually create a set of virtual machines, configure their operating systems, connectivity and supporting software components, to then pass it on to IT to deploy to the class environment and systems, resulting in days, if not weeks of development and setup times.

Then, we should also consider the potential in-session issues, such as the wrong software version or lack of permissions to run the necessary scenarios, that may come up during the course run time, resulting in frustrations for all included parties: instructors, teaching assistants, IT staff, and students.



The Solution

This is where Cyber Ranges come in. Recognized for their efficiency by the various industries worldwide in representing real-world cyber security incidents in a controlled environment for training and analysis purposes, Cyber Range solutions have quickly grown to be critical assets in many organizations.

Specifically, because Cyber Ranges provide a safe and flexible environment that allows anyone to gain hands-on cyber skills, they have been recognized as central to cybersecurity education, training and certification.

The Cyber Range environments allow the blending of attack and defence scenarios in simulations and emulations of real components and systems in a cost-effective and rapid manner.

Consequently, with ENFOCOM CYBERSECURITY being at the centre of the cybersecurity business in Alberta, Canada, offering an operational Cyber Range that is easily accessible through a web interface and already containing a library of over 32 courses, the University of Calgary didn't have to go far from home to find a suitable platform for developing the newly introduced degree.

Although the Cyber Range platform already came with a library of courses and curricula, it was customized to the needs of the university's teaching staff and to accommodate the incoming cohort of 50 students in 2022 while considering the potential demands on the Cyber Range.

ENFOCOM's Cyber Range enabled teaching staff to easily replicate and adjust the existing teaching materials and exercises within the Cyber Range environment through a simple drag-and-drop interface. It then allowed to deploy and test out the produced materials and exercises in minutes, with the ability to reuse, replicate and scale the deployed environment to match any teaching needs.

The Solution

Cyber Range Training

Finally, the Cyber Range allowed the instructors to easily shape the environment in near real-time and monitor the environment's and student performance using a collection of easy-to-use monitoring and control tools that support a variety of metrics. The former also opened the possibility of on-the-fly adjustments to the lesson to match the current student's background, needs and performance.

For example, if the students required a deeper dive into a specific module of the course, instructors could, within minutes, either use pre-existing modules or re-configure the environment and deploy it to the platform, where students benefited from a customized and personalized learning approach.

Furthermore, the Cyber Range allowed instructor-aided learning, as instructors can take control of students' resources and provide assistance and direction. It also permitted instructors to see the most common roadblocks in students' understanding and add hints by, for example, highlighting a specific location to investigate for the necessary information. This is compared to previously used static learning materials like PowerPoint slides or PDFs.

Cyber Range Benefits

- *Preconfigured Virtual Machines*
- *Start lessons in minutes*
- *Dynamic, adaptive courses*
- *Simulate real-world conditions*
- *Maintain academic integrity*
- *Advanced metrics and reporting*

The Results

Consequently, with fast setup times, an easy-to-learn drag-and-drop interface, flexible and reusable content and rapid resource deployment times, ENFOCOM's Cyber Range allows instructors to spend more time teaching and less time dealing with logistics and support of the tools that are supposed to assist them and make their lives easier.

Using ENFOCOM's Cyber Range, the University of Calgary has already successfully run two 25-student cohorts. The Cyber Range removed any barriers for the instructors to offer modern cyber security training, accommodate various training scenarios and provide many challenges and experiences for the upcoming cybersecurity experts. With instructors now focused on teaching aspects instead of logistics, they can engage students with realistic customized training scenarios and challenges.

Cyber Range also provided an effective way for the university to provide and demonstrate the new program's educational value while elevating its education program to new heights.

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About the Author

Edward Rochester, B.Sc., M.Sc., Ph.D. Candidate, has been working as a Security Analyst with ENFOCOM since 2020 and is an active researcher in the field of cybersecurity and data privacy.
Edward will continue his Ph.D. with the University of Calgary focusing on the field of cybersecurity and data privacy while providing valuable insight and innovation to the future of the organizations which he supports.

About Us

ENFOCOM CYBERSECURITY is on a mission to help Canadian organizations protect their data from being stolen or taken for ransom.

With our partners Field Effect, Raytheon Canada and the University of Calgary we are confident that we can lead the way in cybersecurity growth and education with cutting-edge technology of the Cyber Range.

The Cyber Range facilitates training which can be deployed in minutes in the cloud or at our facility. By working with us our customers are always working with the latest technology, products and services that improve their cybersecurity posture better today, than yesterday.

Discover the Cyber Range Benefits at

ENFOCOM.COM