

# EDURange: Meeting the Pedagogical Challenges of Student Participation in Cybertraining Environments

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# Motivation for Building EDURange

Existing testbeds have certain limitations...

As instructors, we were looking for:

flexibility

scalability

analysis skills

# Analysis Skills

- Verify Assumptions using network messages, error messages, system calls, static analysis
- Matching actual system behavior with predicted behavior
- Extracting information from opaque artifacts
- Creating resilience based on understanding failure modes

# The EDURange Architecture

Hosted on EC2

Minimal “client”  
requirements



Currently 6 scenarios (reconnaissance, binary analysis, network topology discovery, ...)

# EDURange Events/Workshops

When	Where/What		# of people
June 2013	SISMAT		12
Aug 2013	EDURange Internal Hackathon I		11
Oct 2013	CCSC-NW		8 faculty
Nov 2013	Evergreen Network Security course		40
Jan 2014	MPICT		7 faculty
Feb 2014	L&C Cybersecurity course		19
Feb 2014	UofC graduate seminar		4
March 2014	UofC Network Security course		25
March 2014	SIGCSE workshop		14 faculty
May 2014	EDURange Internal Hackathon II		15
June 2014	SISMAT 2014		17

# Types of Exercises

- Reconnaissance: finding hosts with open ports on a complex network
- Fuzzing a calculator
- Crafting packets to find data on a hidden host
- Analyzing system calls by an unknown process
- Finding malware within a linkable file format

# Lessons Learned

Techno-pedagogical challenges

Students need significant scaffolding

No client software to install, but distributing credentials was a speed bump

Faculty want exercises they can use right away

*Everyone is proposing a cybertraining environment, why is this task more subtle than many anticipate?*

# Where to get it

- <http://github.com/edurange/>
- <http://edurange.org/>