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

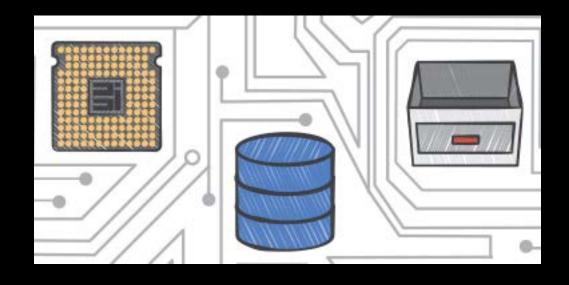
Analysis Skills

- 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/