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Virtual Cyber Exercises with Moodle

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Agenda

- Introduction
- Cyber Exercise Overview
- Range Technologies
- Simulations
- Integrating with Moodle

Introduction

- Who we are
- What we do

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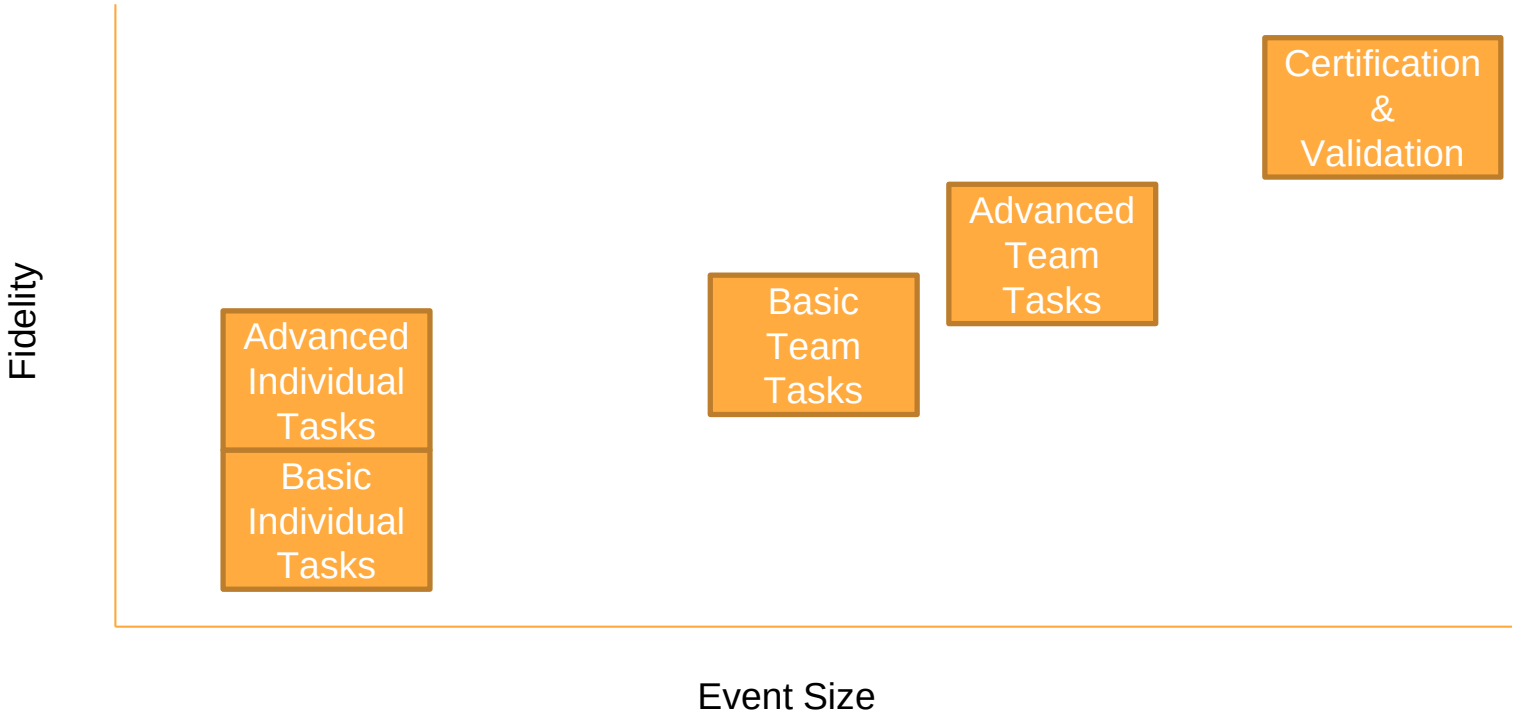
Cyber Exercise Overview



Range Technologies

Deprecating

Open Source Lab Builder

Full Scale Environment Builder

Coming soon

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Simulations

- **GHOSTS**
  - for Non-Player Characters
- **GreyBox**
  - for backbone routing
- **TopGen**
  - for Simulated Internet websites and DNS
- **vTunnel**
  - for out of band command and control
- **WELLE-D**
  - for Wi-Fi simulation
- **StormBox**
  - for low fidelity user simulation

Assessing Performance

Assessment

- LMS – Moodle, of course!
- LRS – Learning Locker
- xAPI – from Moodle, H5P, and VMs
- MELK – Moodle, Elasticsearch, Logstash, Kibana to visualize performance
- NICE Cyber Security Workforce Framework

Assessment with Moodle

Activities
- Quiz
- Feedback
- Files

Features
- Competencies

Plugins
- H5P
- Virtual Programming Lab
- Course Format Board
- Logstore xAPI
- Local Metadata

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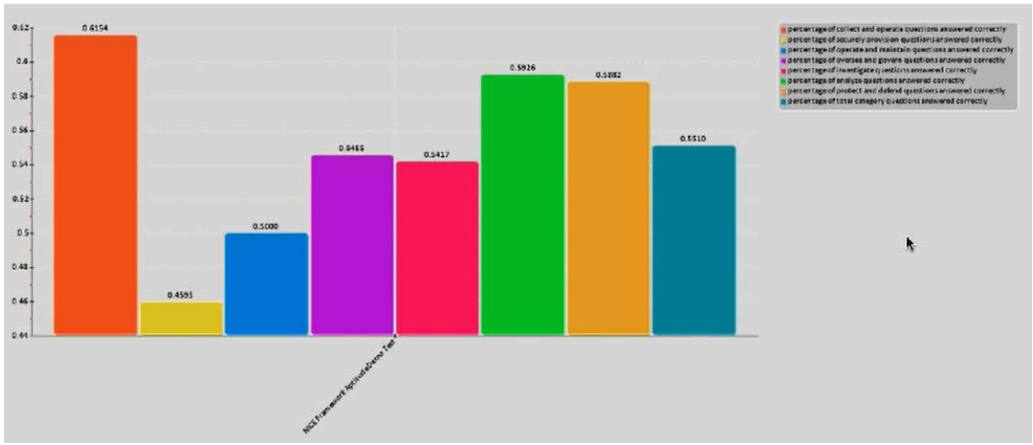
Moodle Competencies

- Cyber Evaluator Tool Output



Custom Integrations with Moodle

- Import courses from old STEP LMS
- Match organizational branding
- Display Moodle content on other systems
- Provide access to VM consoles
- Categorize training and identify skill gaps

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Moodle Development

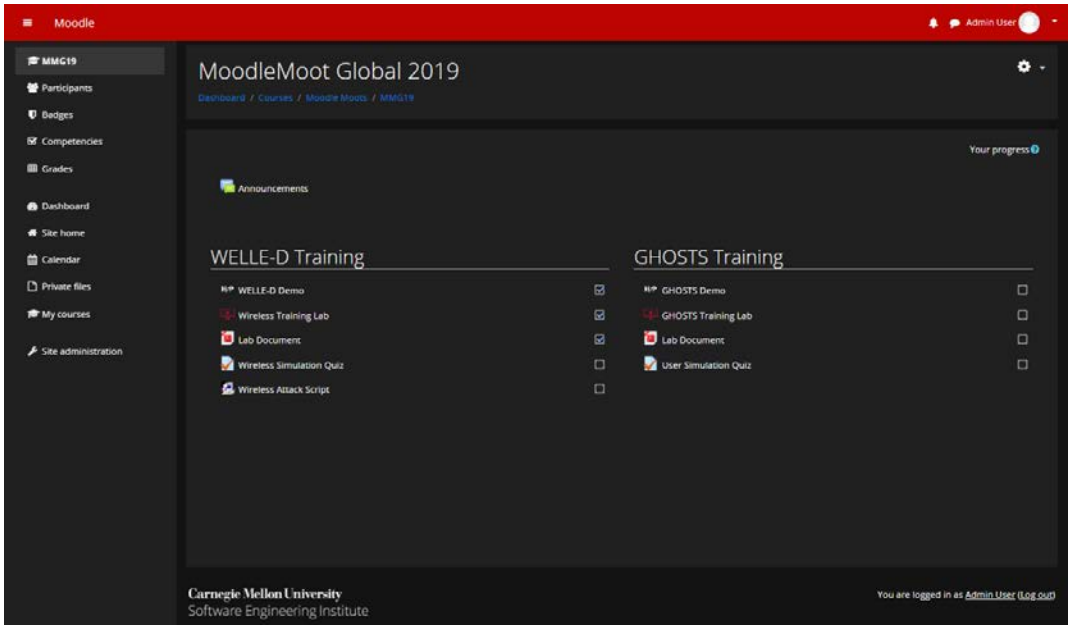
- Content Sync Plugin
- Purpose: Add Moodle content to the Foundry content discovery system
- Type: admin tool
- Leverages: OAUTH2, scheduled tasks
- Communicates with the Foundry API to add content links and images

Moodle Development

- Custom Theme Plugin
- Purpose: Provide a dark theme to match other sites
- Type: theme
- Leverages: Boost theme, local metadata plugin
- Automatically redirects users to OAUTH2 identity server
- Renderer overrides H5P logo with activity logo
- Renderer overrides and rearranges course listing display
- Renderer uses local metadata plugin to override page layout for activities

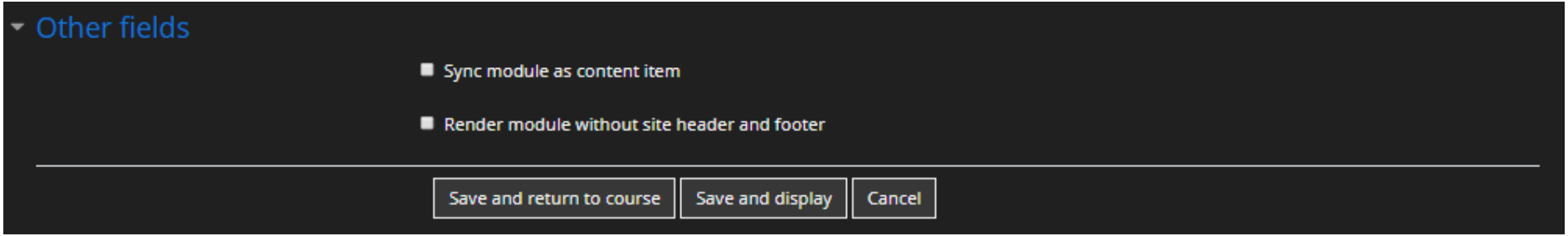
Moodle Development

- Custom Theme and course format board



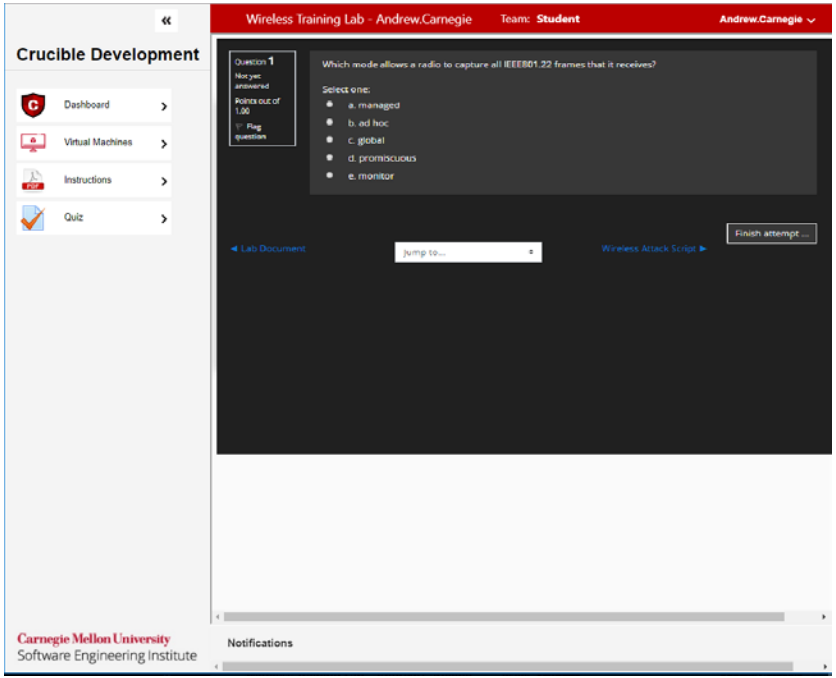
Moodle Development

- Local Metadata
- Used to determine whether to sync content to Foundry
- Used to determine whether to display activity as embedded



Moodle Development

- Crucible and Local Metadata



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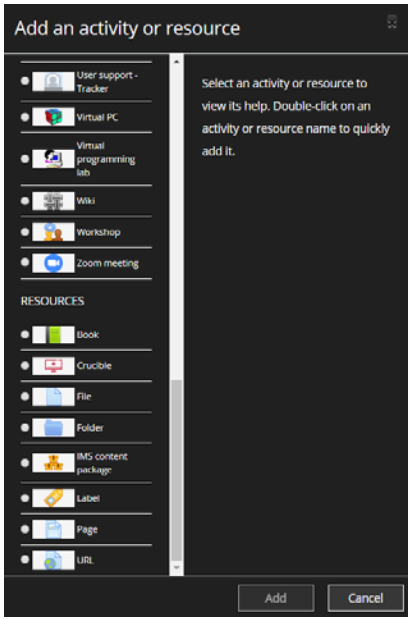
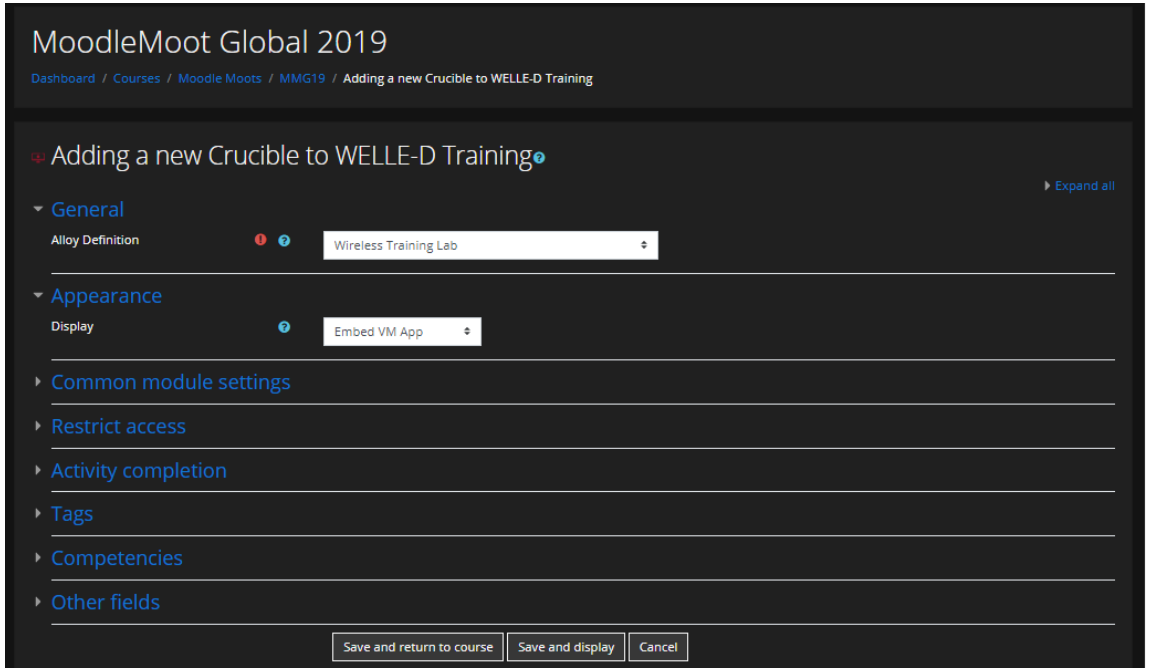
Moodle Development

- Crucible Plugin
- Purpose: Deploy labs and access VM consoles
- Type: activity
- Leverages: OAUTH2
- Allows course creators to add lab as a Moodle course activity
- Communicates with the Crucible API
- Pulls name and description of lab from Crucible
- Pulls lab history from Crucible
- Embeds Crucible VM consoles or links to the full Crucible Player

Moodle Development

- Crucible



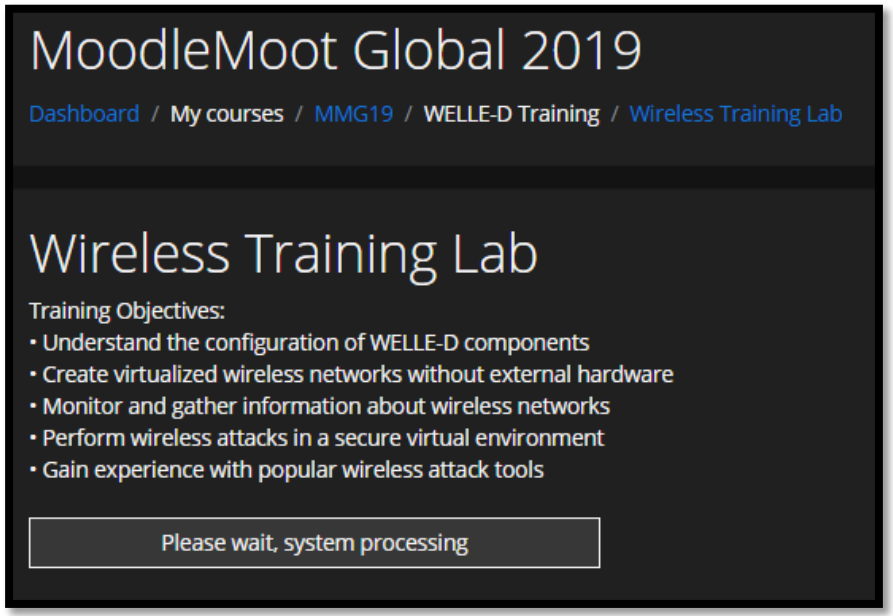


Moodle Development

- Crucible

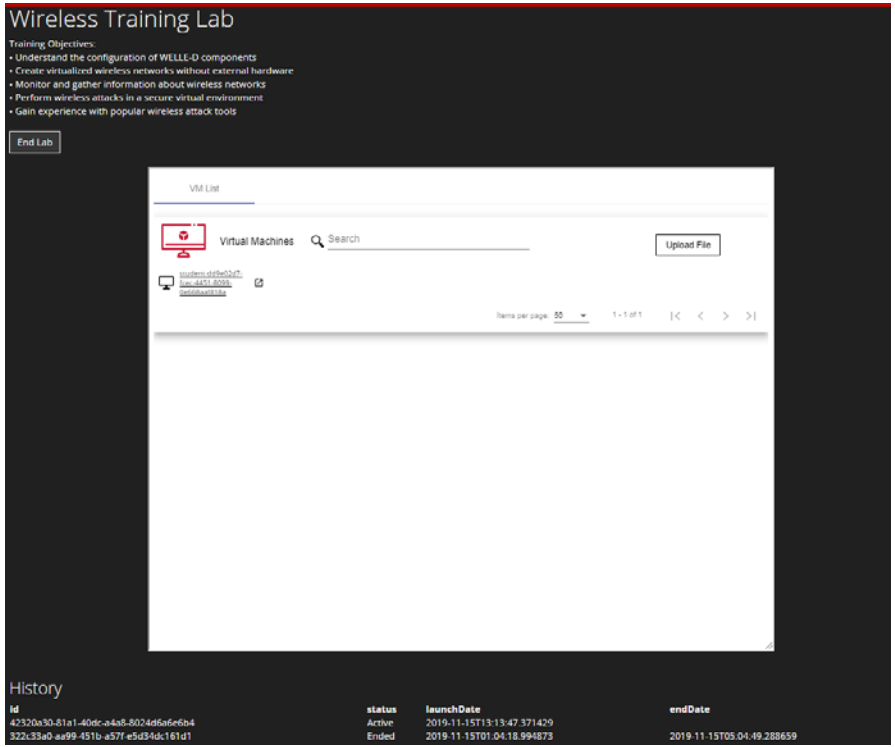
Moodle Development

- Crucible



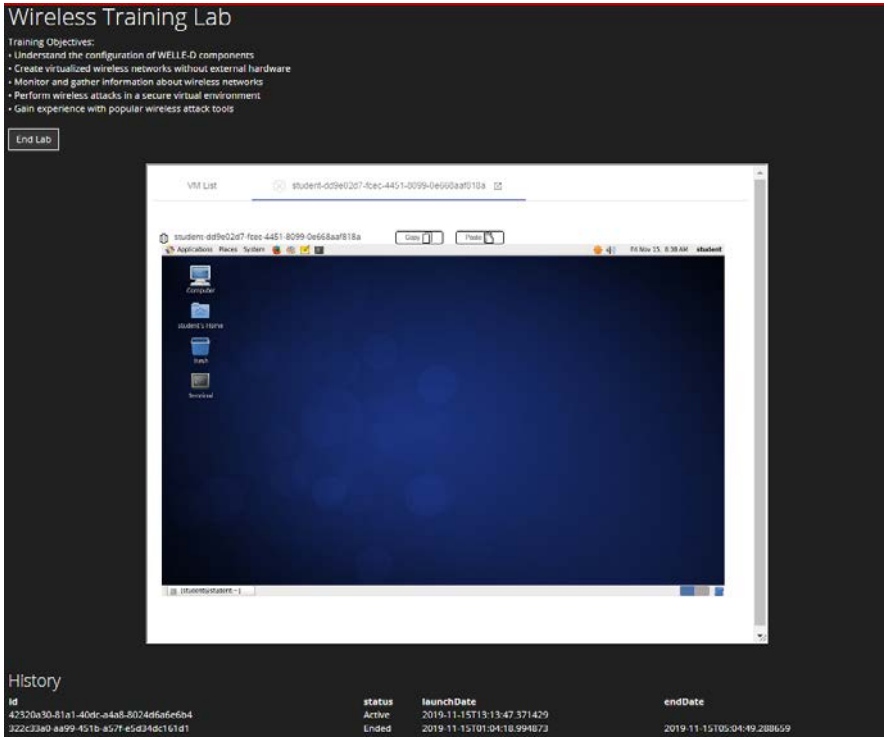
Moodle Development

- Crucible



Moodle Development

- Crucible



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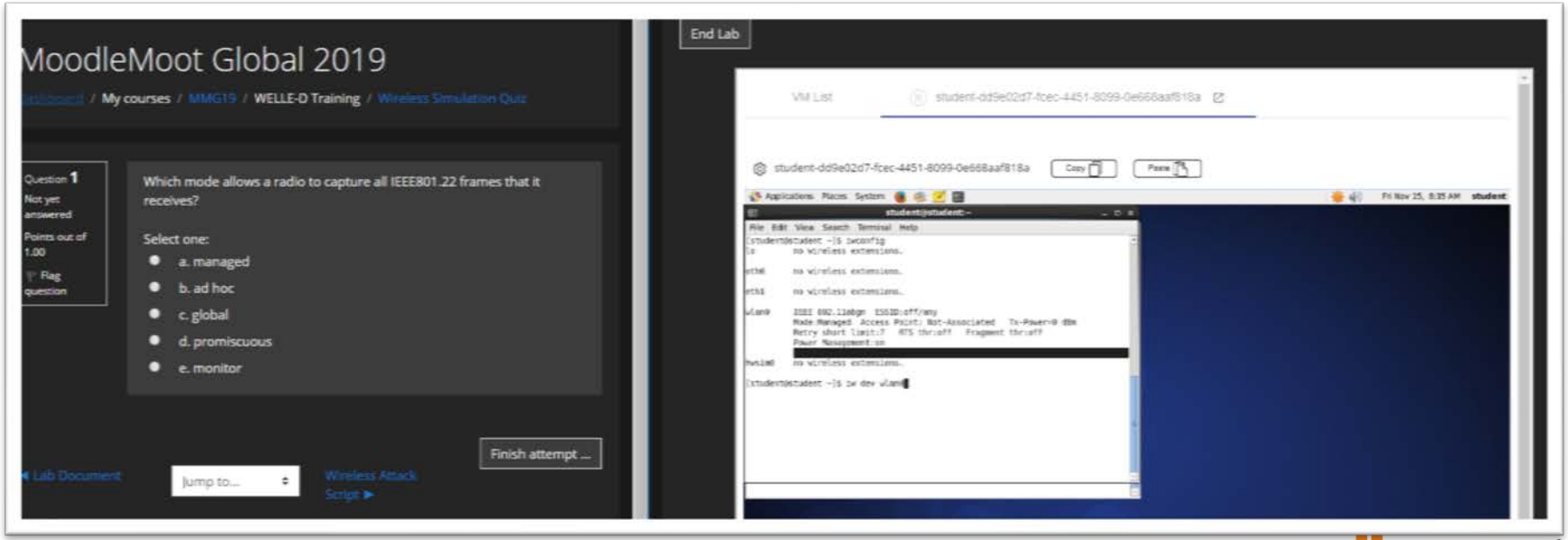
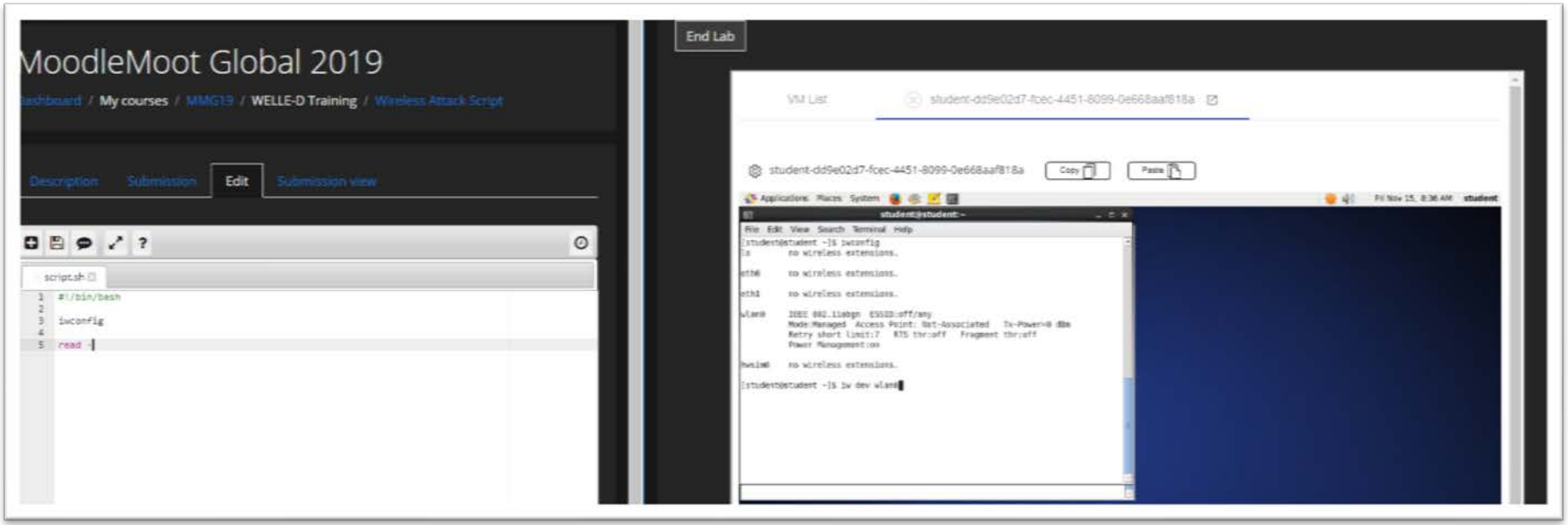
Moodle Layout

- Quiz



Moodle Layout

- VPL



Future Moodle Development

- Further integration with Crucible
- Moodle events and xAPI
- Grading of lab tasks automatically
- Release Crucible and mod_crucible on Github in 2020

http://cmu-sei.github.io