Mapping Low Cost and Open Source Labs to the NICE Workforce Framework

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Director National University Center for Cybersecurity

When I find a new lab

Agenda

- Background
- Examples of free labs and how we use them
- Mapping Labs in Airtable

Background

- Hands on labs are a critical component of any cybersecurity program and a requirement to become a Center of Academic Excellence
- Several ways to deliver lab content
  - Develop and deploy labs on internal or outsourced infrastructure
  - Utilize labs from external lab providers
  - Utilize free grant resourced labs
  - Use free and open source labs
- Managing an internal lab environment is expensive

Challenges of Running an Internal Lab

- Help Desk
  - Academic vs Technical issues
  - Hours of operation
    - Student complete school work in the evening and on weekends
  - ”Ticket Management”
- Admin access to systems
- Developing lab content
- Cost

Finding Outsourced Labs

- “Word of Mouth”
- Textbook Vendors
- Vendor booths
- Google

Challenges of Free Labs

- Downtime
- Support
- Updates
- No single vendor provides everything you need
- Publicly available answers
- Course coverage of lab content
- Faculty preparation
- Vendor lab changes

Free/Freemium Providers

- Not an official endorsement from National University

Providers
(No particular order)

Immersive Labs (Free)

NICE Challenge (Free)

Over the Wire (Free)

PicoCTF (Free)

Hack The Box (Freemium)

TryHackMe.com (Freemium)

Blue Team Labs (Freemium)

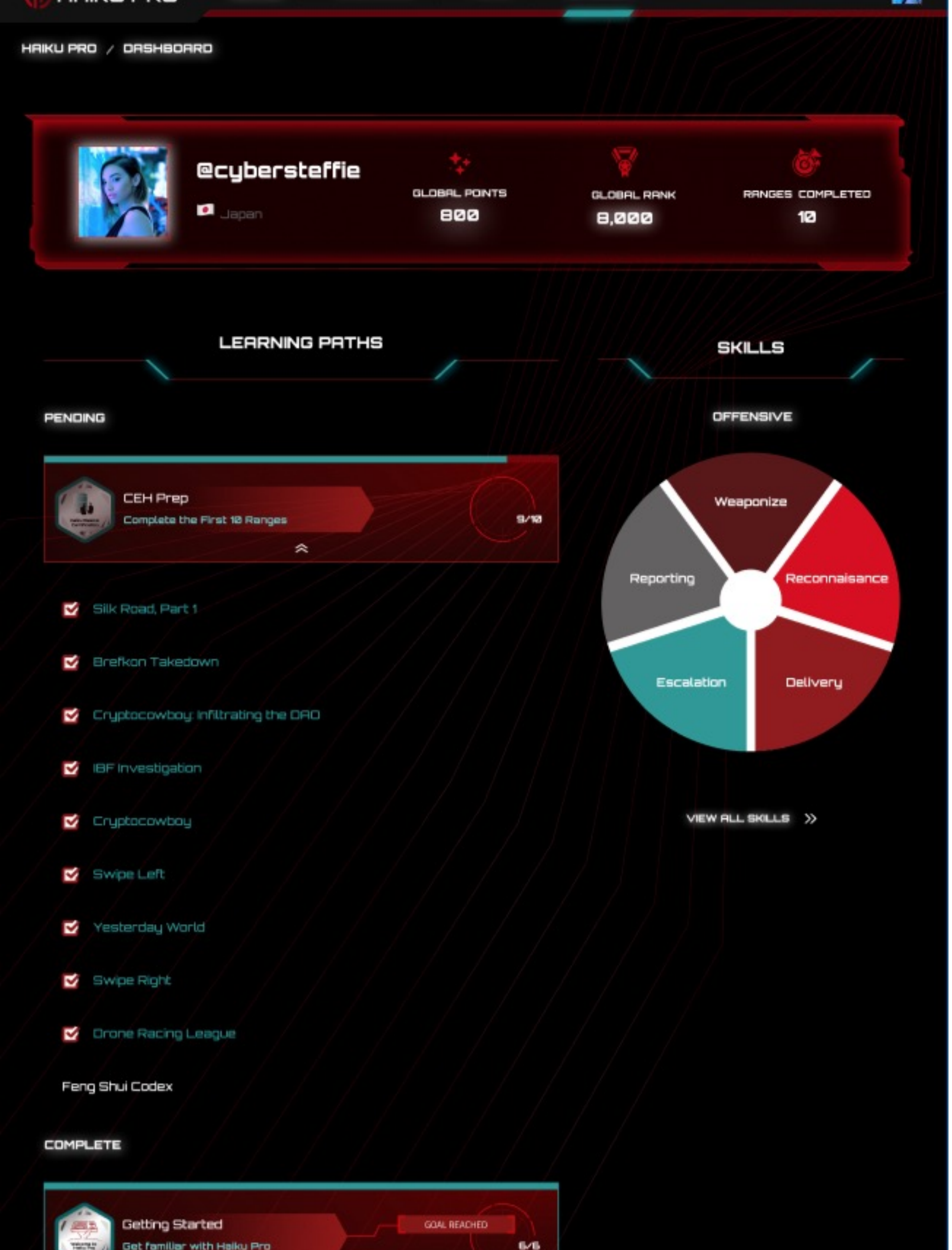
Haiku Pro

(Freemium)

Deploy in the Cloud

- Use Devops tools to deploy labs in the cloud
- Examples
  - Detection Lab
  - Mordor
  - CyberRange

Mapping to Certs



HAIKU PRO / DASHBOARD

@cybersteffie
Japan

GLOBAL POINTS 800

GLOBAL RANK 8,000

RANGES COMPLETED 10

LEARNING PATHS

PENDING

CEH Prep
Complete the First 10 Ranges
9/10

☑ Silk Road, Part 1

☑ Brefkon Takedown

☑ Cryptocowboy: Infiltrating the DAO

☑ IBF Investigation

☑ Cryptocowboy

☑ Swipe Left

☑ Yesterday World

☑ Swipe Right

☑ Drone Racing League

Feng Shui Codex

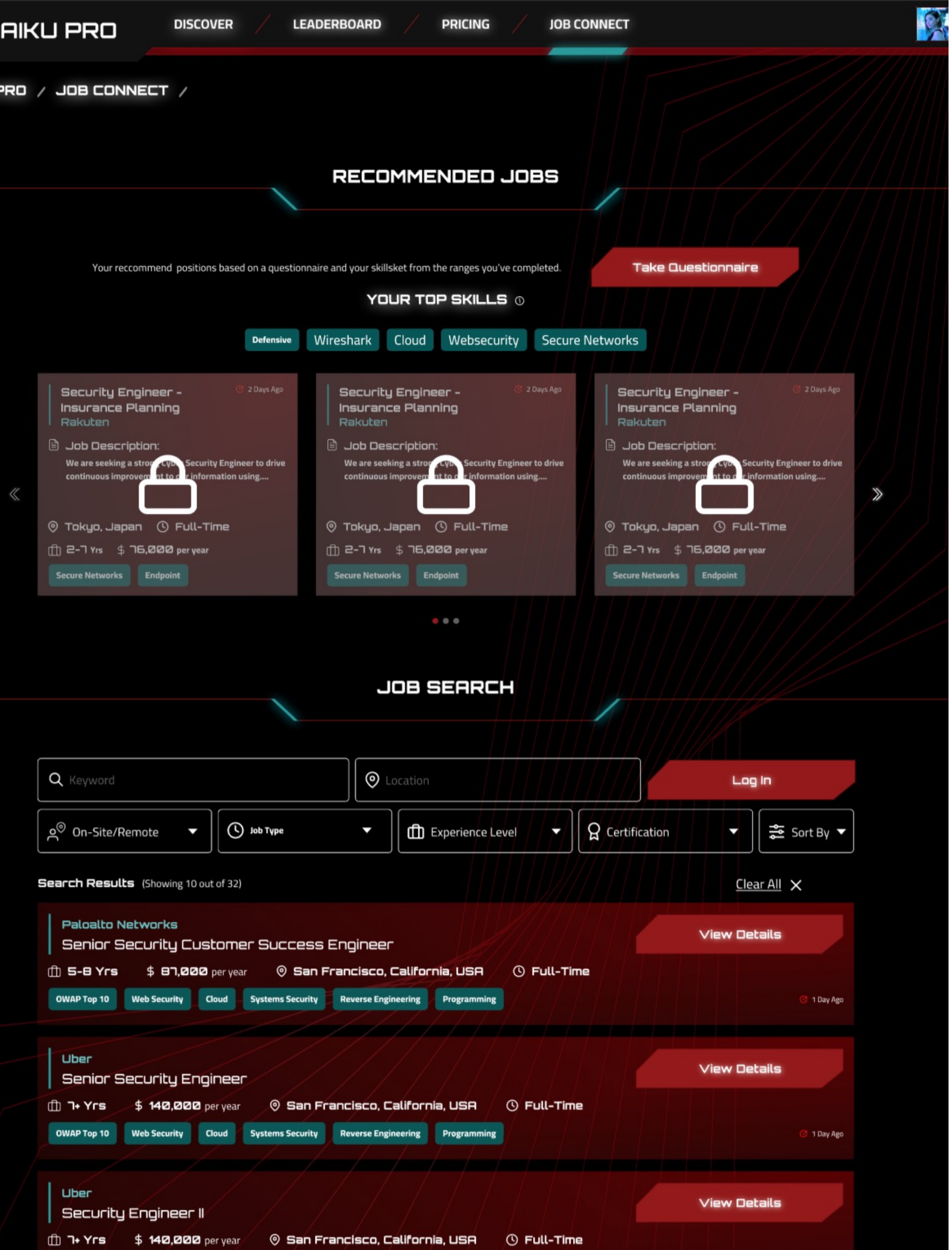
COMPLETE

Getting Started
Get familiar with Haiku Pro
GOAL REACHED
6/6

SKILLS

OFFENSIVE

VIEW ALL SKILLS »



AIKU PRO DISCOVER / LEADERBOARD / PRICING / JOB CONNECT

PRO / JOB CONNECT /

RECOMMENDED JOBS

Your reccommend positions based on a questionnaire and your skillsket from the ranges you've completed.

Take Questionnaire

YOUR TOP SKILLS

Defensive | Wireshark | Cloud | Websecurity | Secure Networks

Security Engineer - Insurance Planning
Rakuten
2 Days Ago
Job Description:
We are seeking a strong Cyber Security Engineer to drive continuous improvement to our information using....
Tokyo, Japan | Full-Time
2-7 Yrs | $ 76,000 per year
Secure Networks | Endpoint

Security Engineer - Insurance Planning
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JOB SEARCH

Keyword | Location | Log In

On-Site/Remote | Job Type | Experience Level | Certification | Sort By

Search Results (Showing 10 out of 32) Clear All ×

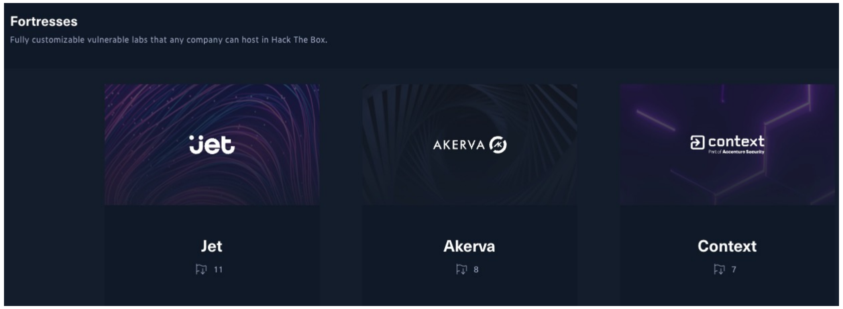
Paloalto Networks
Senior Security Customer Success Engineer
View Details
5-8 Yrs | $ 87,000 per year | San Francisco, California, USA | Full-Time
OWAP Top 10 | Web Security | Cloud | Systems Security | Reverse Engineering | Programming
1 Day Ago

Uber
Senior Security Engineer
View Details
7+ Yrs | $ 140,000 per year | San Francisco, California, USA | Full-Time
OWAP Top 10 | Web Security | Cloud | Systems Security | Reverse Engineering | Programming
1 Day Ago

Uber
Security Engineer II
View Details
7+ Yrs | $ 140,000 per year | San Francisco, California, USA | Full-Time

- Mapping to Jobs

Working with Companies
Hack the Box



Fortresses

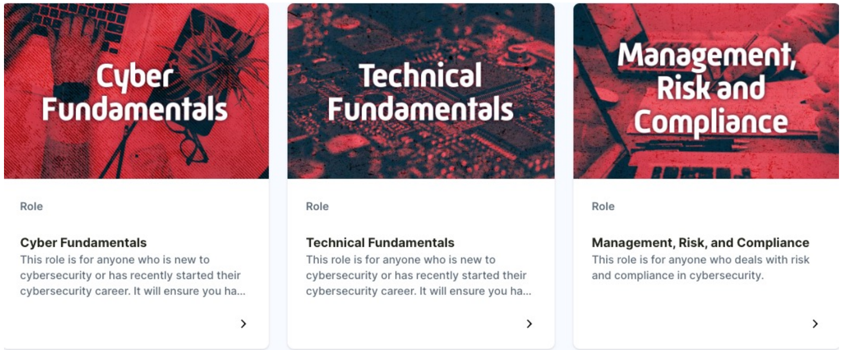
Fully customizable vulnerable labs that any company can host in Hack The Box.

Jet 11

Akerva 8

Context 7

Mapping to Roles
Immersive Labs



Role

Cyber Fundamentals

This role is for anyone who is new to cybersecurity or has recently started their cybersecurity career. It will ensure you ha...

Role

Technical Fundamentals

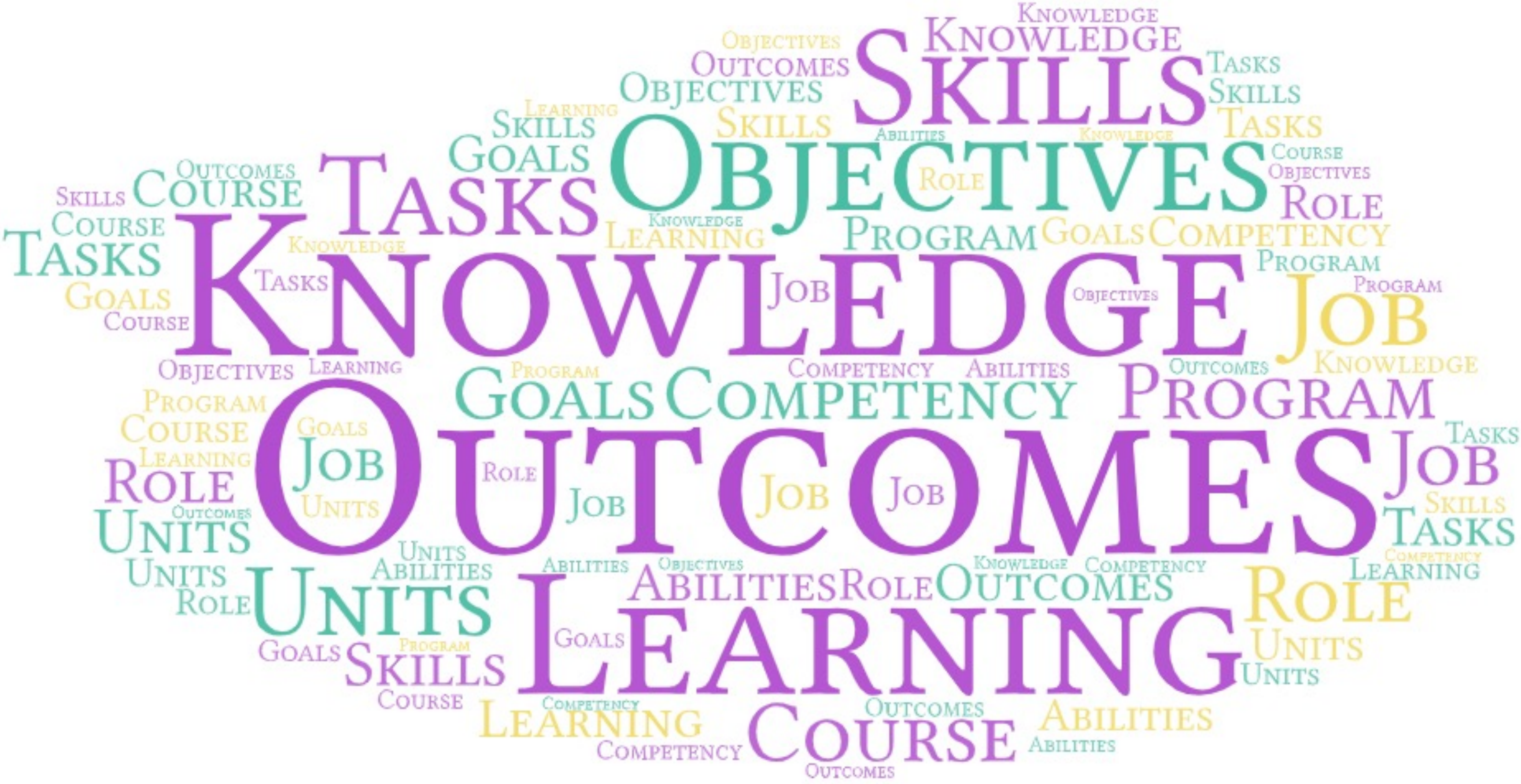
This role is for anyone who is new to cybersecurity or has recently started their cybersecurity career. It will ensure you ha...

Role

Management, Risk, and Compliance

This role is for anyone who deals with risk and compliance in cybersecurity.

So What?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Objectives
Knowledge
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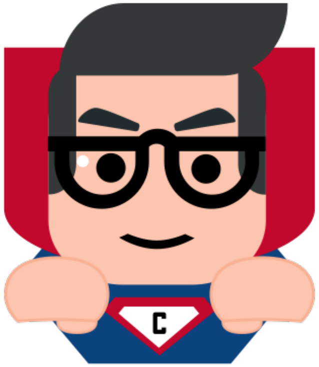
HELP

Airtable

+



Max Power Collection

Mapping Labs To Objectives

Build a catalog of labs mapped to the NICE Framework and CAE KU’s

Student project mapping TryHackMe

Using AirTable

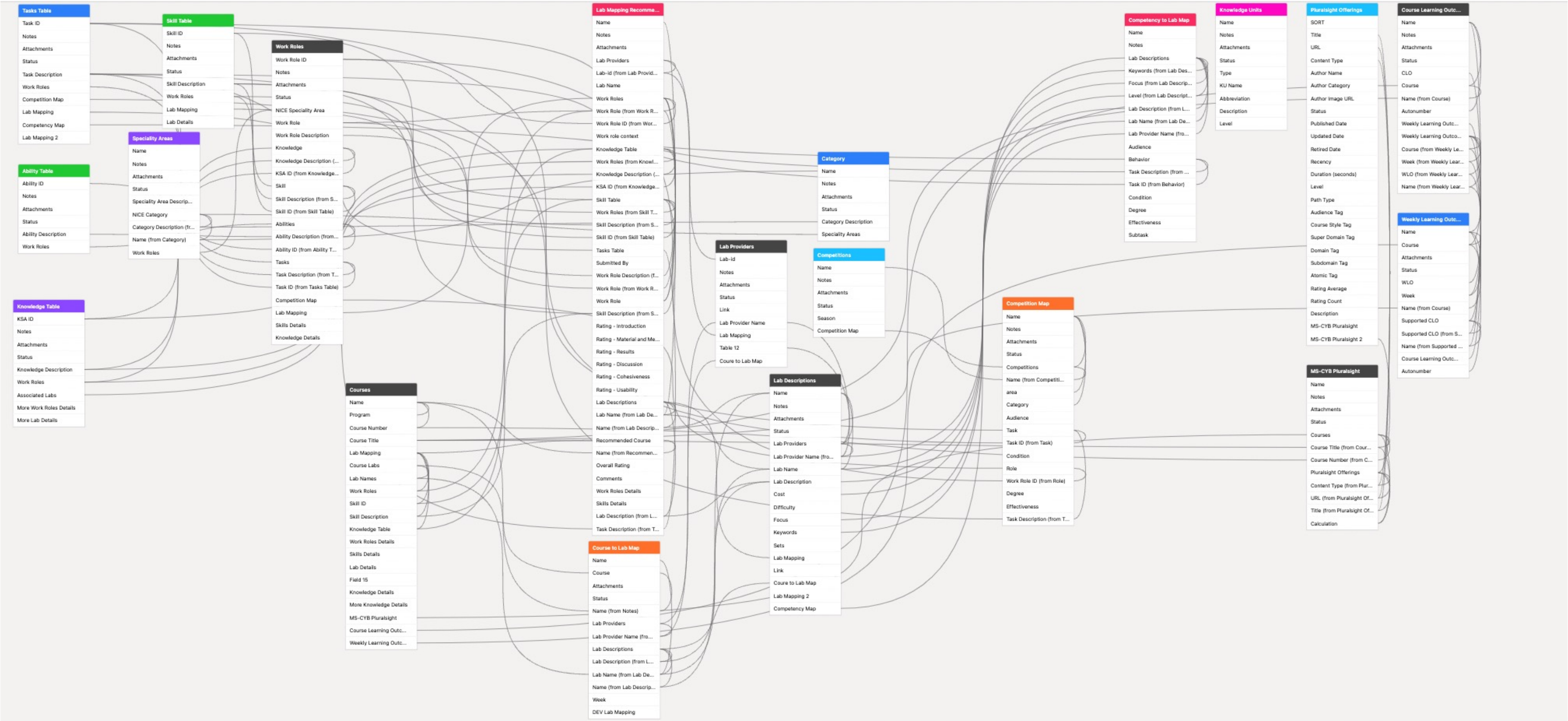
What is Airtable

- “Our powerful, visual platform connects data, people and workflows across the organization, so everyone's using the same source of truth. It's easy to start building on Airtable, and endlessly extensible: anyone can create and automate apps that perfectly fit their needs.”
- Airtable About Page

Airtable

- Visual way to build complex databases and easily display the data
- Easy to connect data and join tables
- Easy import

Structure


Tasks Table
Task ID
Notes
Attachments
Status
Task Description
Work Roles
Competition Map
Lab Mapping
Competency Map
Lab Mapping 2
Skill Table
Skill ID
Notes
Attachments
Status
Skill Description
Work Roles
Lab Mapping
Lab Details
Work Roles
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Knowledge Table
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Status
Knowledge Description
Work Roles
Associated Labs
More Work Roles Details
More Lab Details
Courses
Name
Program
Course Number
Course Title
Lab Mapping
Course Labs
Lab Names
Work Roles
Skill ID
Skill Description
Knowledge Table
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More Knowledge Details
MS-CYB Pluralsight
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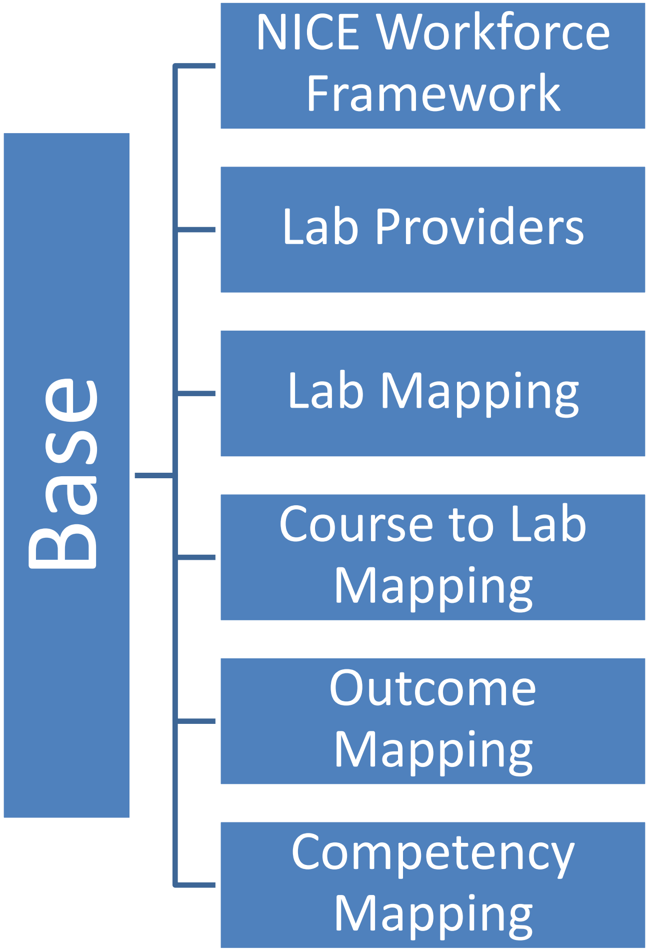
Structure



Base

NICE Workforce Framework

Lab Providers

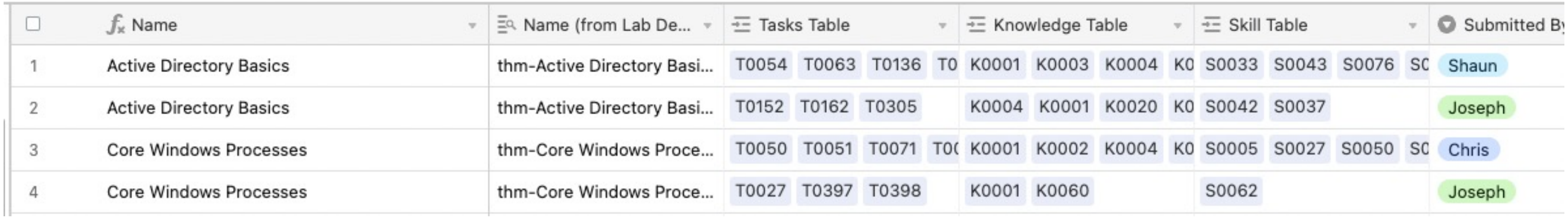
Lab Mapping

Course to Lab Mapping

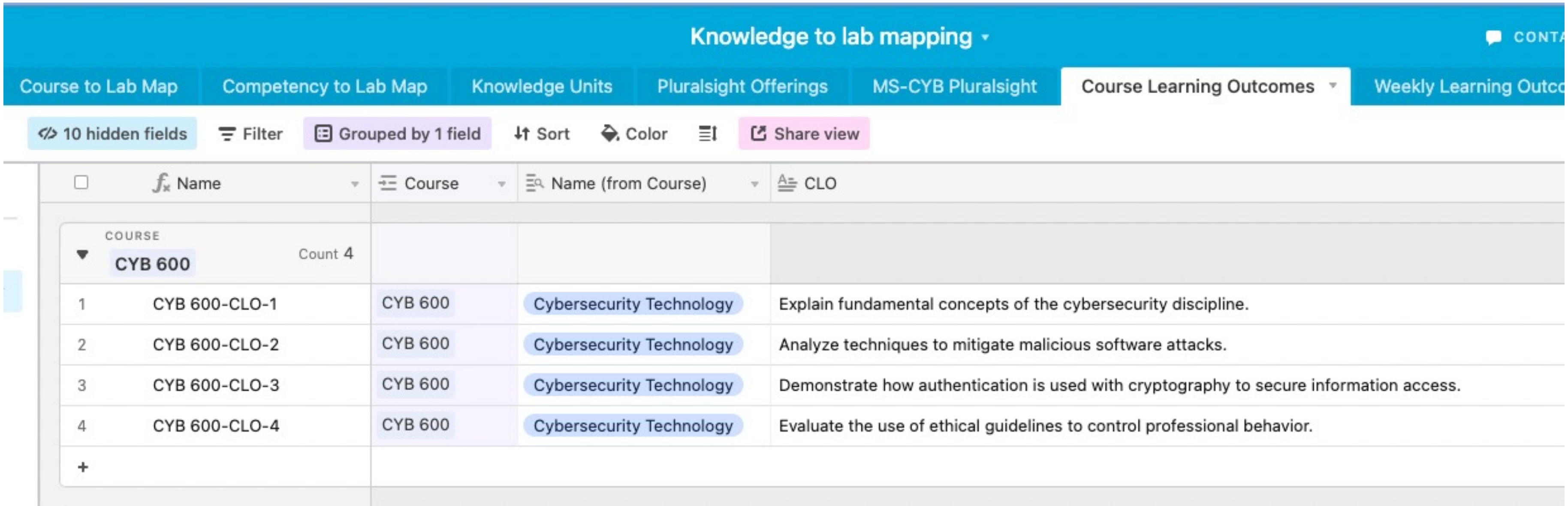
Outcome Mapping

Competency Mapping

Student Mapping to NICE Framework



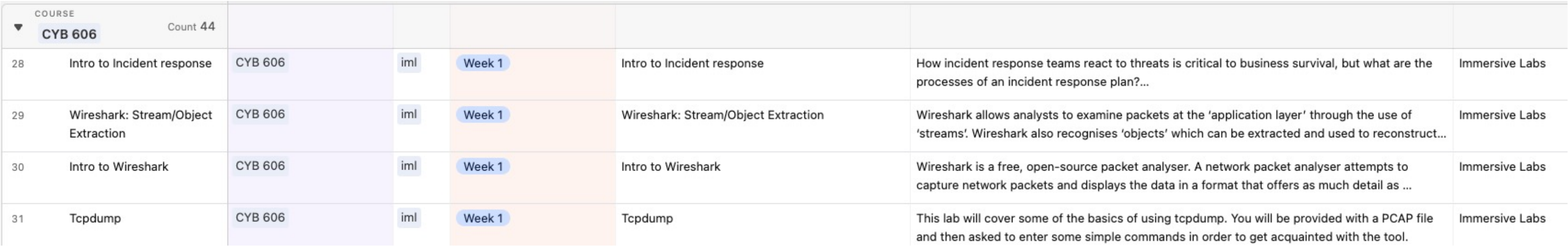
☐	Name	Name (from Lab De...	Tasks Table	Knowledge Table	Skill Table	Submitted B
1	Active Directory Basics	thm-Active Directory Basi...	T0054 T0063 T0136 T0	K0001 K0003 K0004 K0	S0033 S0043 S0076 S0	Shaun
2	Active Directory Basics	thm-Active Directory Basi...	T0152 T0162 T0305	K0004 K0001 K0020 K0	S0042 S0037	Joseph
3	Core Windows Processes	thm-Core Windows Proce...	T0050 T0051 T0071 T0	K0001 K0002 K0004 K0	S0005 S0027 S0050 S0	Chris
4	Core Windows Processes	thm-Core Windows Proce...	T0027 T0397 T0398	K0001 K0060	S0062	Joseph



	Name	Course	Name (from Course)	CLO
1	CYB 600-CLO-1	CYB 600	Cybersecurity Technology	Explain fundamental concepts of the cybersecurity discipline.
2	CYB 600-CLO-2	CYB 600	Cybersecurity Technology	Analyze techniques to mitigate malicious software attacks.
3	CYB 600-CLO-3	CYB 600	Cybersecurity Technology	Demonstrate how authentication is used with cryptography to secure information access.
4	CYB 600-CLO-4	CYB 600	Cybersecurity Technology	Evaluate the use of ethical guidelines to control professional behavior.

Course Learning Outcomes

Lab to Course Mapping

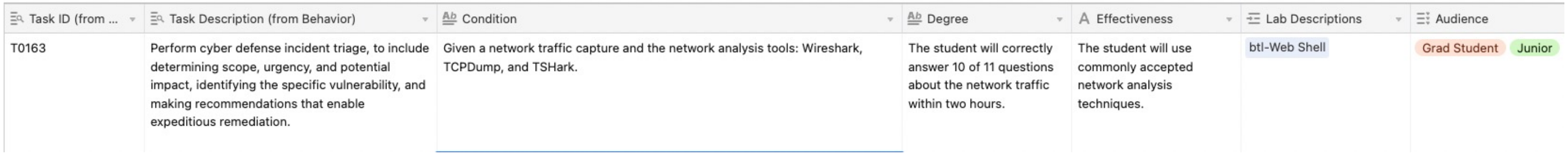


COURSE

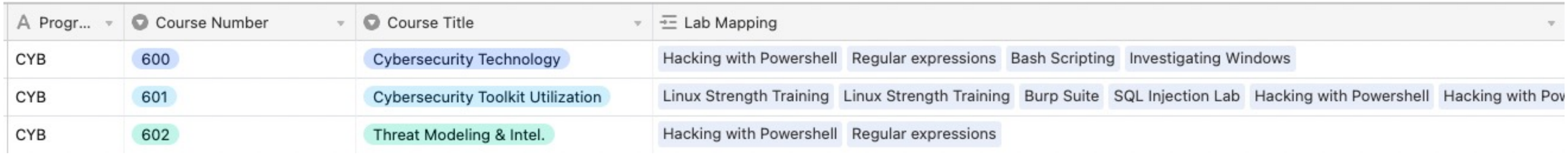
CYB 606 Count 44

28	Intro to Incident response	CYB 606	iml	Week 1	Intro to Incident response	How incident response teams react to threats is critical to business survival, but what are the processes of an incident response plan?...	Immersive Labs
29	Wireshark: Stream/Object Extraction	CYB 606	iml	Week 1	Wireshark: Stream/Object Extraction	Wireshark allows analysts to examine packets at the 'application layer' through the use of 'streams'. Wireshark also recognises 'objects' which can be extracted and used to reconstruct...	Immersive Labs
30	Intro to Wireshark	CYB 606	iml	Week 1	Intro to Wireshark	Wireshark is a free, open-source packet analyser. A network packet analyser attempts to capture network packets and displays the data in a format that offers as much detail as ...	Immersive Labs
31	Tcpdump	CYB 606	iml	Week 1	Tcpdump	This lab will cover some of the basics of using tcpdump. You will be provided with a PCAP file and then asked to enter some simple commands in order to get acquainted with the tool.	Immersive Labs

Competency Example



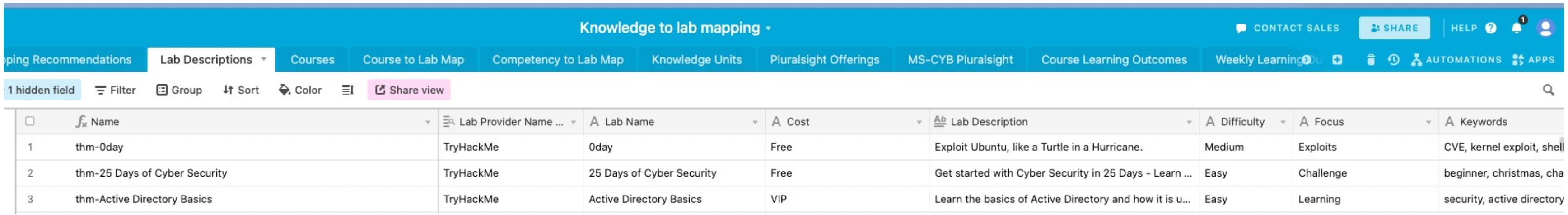
Task ID (from ...	Task Description (from Behavior)	Condition	Degree	Effectiveness	Lab Descriptions	Audience
T0163	Perform cyber defense incident triage, to include determining scope, urgency, and potential impact, identifying the specific vulnerability, and making recommendations that enable expeditious remediation.	Given a network traffic capture and the network analysis tools: Wireshark, TCPDump, and TSHark.	The student will correctly answer 10 of 11 questions about the network traffic within two hours.	The student will use commonly accepted network analysis techniques.	btl-Web Shell	Grad Student Junior



Progr...	Course Number	Course Title	Lab Mapping
CYB	600	Cybersecurity Technology	Hacking with Powershell Regular expressions Bash Scripting Investigating Windows
CYB	601	Cybersecurity Toolkit Utilization	Linux Strength Training Linux Strength Training Burp Suite SQL Injection Lab Hacking with Powershell Hacking with Pow
CYB	602	Threat Modeling & Intel.	Hacking with Powershell Regular expressions

Course Labs

Lab List



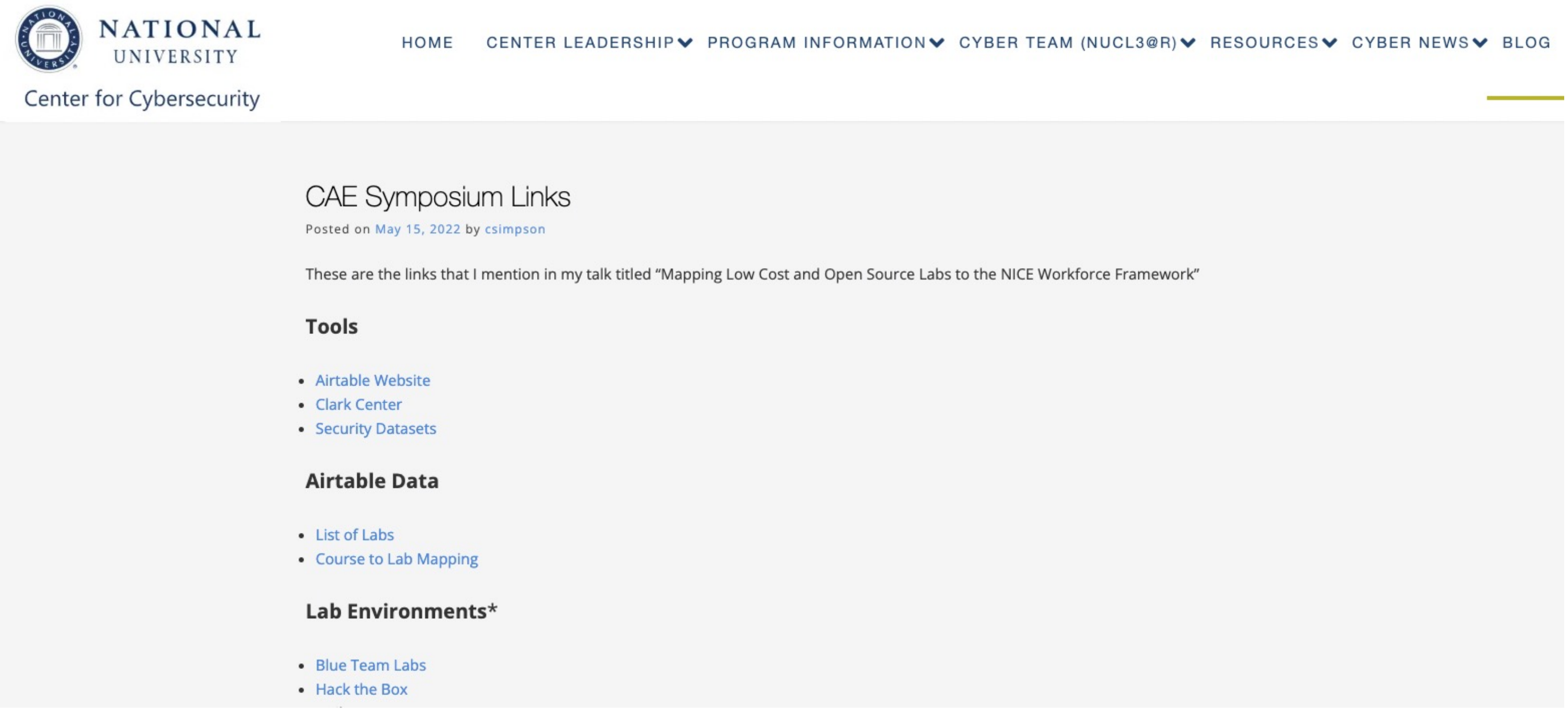
□	Name	Lab Provider Name ...	Lab Name	Cost	Lab Description	Difficulty	Focus	Keywords
1	thm-0day	TryHackMe	0day	Free	Exploit Ubuntu, like a Turtle in a Hurricane.	Medium	Exploits	CVE, kernel exploit, shell
2	thm-25 Days of Cyber Security	TryHackMe	25 Days of Cyber Security	Free	Get started with Cyber Security in 25 Days - Learn ...	Easy	Challenge	beginner, christmas, cha
3	thm-Active Directory Basics	TryHackMe	Active Directory Basics	VIP	Learn the basics of Active Directory and how it is u...	Easy	Learning	security, active directory

How much data in Airtable

- 607 Labs with descriptions
- 200 Weekly Learning Outcomes
- 16 classes
- NICE Workforce Framework
  - Roles
  - Knowledge
  - Skills
  - Tasks

Links and Videos

https://www.nucsia.org/2022/05/cae-symposium-links/



CAE Symposium Links

Posted on May 15, 2022 by csimpson

These are the links that I mention in my talk titled "Mapping Low Cost and Open Source Labs to the NICE Workforce Framework"

Tools

- Airtable Website
- Clark Center
- Security Datasets

Airtable Data

- List of Labs
- Course to Lab Mapping

Lab Environments*

- Blue Team Labs
- Hack the Box

Collaboration

- Happy to share access
- Welcome to enter data
- Evidencing Competency Working Group 2
  - Evaluating Tools

Questions?

- Email: csimpson@nu.edu

CENTERS OF ACADEMIC EXCELLENCE IN CYBERSECURITY
CAE
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