Cyber Range Poulsbo

WA State Educational Cyber Range.

An Open Educational Resource

Available to all Washington State educational institutions at no cost.

- K-12 Schools
- CTC
- Universities
- Gov/Public Sector
- Non Profits
- Local Community

Currently on architecture version 2.

Funded by WA State / Grants / Donations / Sponsorships

CRP Core Pillars

Purpose Built Data Center

Datacenter

Fully Managed Datacenter.

Allows the cyber range to host and manage services that public cloud providers restrict / rate limit

Order of magnitude more cost efficient than public cloud.

Azure - 1 CPU Core - 45/month
AWS - 1 CPU Core - 42/month
Cheapest Public Cloud - 18/month
Cyber Range - Cost Amortized over 5 years
- Day 1 -> 13/month
- 3 Yr -> 4.5/month
- 5 Yr -> 2.5/month

Built with Open Source

Open Source

We use open source software to power,

- Data center
- Cloud Platform
- Exercises/Scenarios/Labs/Camps/Competitions
- Curriculum Catalogue
- And every where possible.

Equitable Access via Range Platform (UX/Distribution)

Range Platform

Accessible from anywhere anytime on any device.

Simple onboarding process.

Simple UI / Easy to use.

Single place to interact with all parts of the cyber range.

Publish curriculum / environments / projects to target audience.

Focus on Real World Data

Special Projects

Cyber Range has a keen focus on hosting real world projects that collect and present real data.

- PISCES
- HONEYPOT STACK
- FLOATING SENSOR
- VIRTUAL INTERNET
- WA AUTONOMOUS VEHICLE CLUSTER

Innovation Hub, Incubator & Accelerator

Bridging Academia and Industry

Turning capstone projects and academic research projects into long term sustainable projects via

- Hosting
- Advisory services and governance
- Leveraging industry partner networks
- Help find grants and sponsorship opportunities.
- etc

Ecosystem / Network Effects

Cyber Range Funational Parts

- **Learn**
    - Open catalogue of curriculum + environments in one place.
- **Train**
    - Get workforce ready with hands-on experience with real world projects like PISCES.
- **Build**
    - RnD, Capstone Projects, Joint Projects (School-School, School-Industry).
- **Deploy**
    - Support to deploy hardware and software in the cyber range at no cost.
- **Maintain**
    - Offload infrastructure/software dependencies to the cyber range and focus on building.
- **Incubate/Accelerate**
    - Advisory/Governance/Operational support to take academic/research projects into the real world.
- **Ecosystem**
    - Working at the grassroots level directly with instructors/students.
    - Network effects from strong partnerships.
    - Statewide distribution via cloud platform

Past (V1), Present(V2) and Future(V3)

Version 1: WWU CISS LAB

MAY 2017

Erik Freiheim WWU CISS Director kicks off the Cyber Range in Poulsbo campus as a virtual lab for WWU CISS program what can be used by all Western campus' remotely. With the explicit goal to open it up to all WA state educational institutions once build and tested.

Hires first employee Paul Haichcock - Cloud System Administrator

Boeing Donates 750K worth of servers.

Sets up Poulsbo datacenter and operations begins.

Version 2: Controlled Rollout (Limited Avail)

August, 2019

Hired Cyber Range Master - Vipul Kumar

We open up cyber range to close partners to get feedback and iterate.

Summer 2020

Cyber range cloud platform is launched, opening up cyber range to all WA state educational institutions with some caps.

Version 2 has a upper limit of roughly 1000-1200 students due to resource limitations.

Student Network

2020-2021 - 334 (Fall, Winter, Spring, Summer) -> Platform Launched

2021-2022 - 513   (Fall, Winter, Spring, Summer)

2022-2023 - 1200 (Fall, Winter, Spring, Summer)

2023-2024 - 350 - 500 (Fall)***

Events Delivered

~ 8 - 10 Events delivered every year across K-12/CTC/Universities

K-12 Experiments

- Clover Park High School
- Hazen High School
- Renton High School
- Lindbergh High School
- Richland High School
- Hanford High School
- ACH High School
- Bainbridge High School
- Sequim Middle School
- Stevens Middle School (Port Angeles)
- Commodore Options School (Bainbridge)

Version 2: Org Growth

Spring/Summer, 2022

Hired Cyber Range Academic Liaison - Angela Henderson

Cyber Range received state allocation for Equipment Upgrade and continued Support.

Kicks off equipment procurement with state funding.

Summer 2023

Expanded our datacenter capacity to support up to 5000 students every year.

Hired Cyber Range Research Associate - Sally Bass

Hired Cyber Range Software Developer - Sneha Shinde

V2 Demo

Version 3 - General Availability

Cloud Platform V3

Feature List
- Self service via our website
- Class & event scheduling
- Canvas LMS Integration
- No VPN / On the fly VPN Creds
- Multi hypervisor (Openstack, Virtualbox, Proxmox)
- Multi cloud (AWS, DO)
- Collections
  - Teach Cyber
  - Cyber.org
  - Cyber Heros
  - Seedlabs
  - Labtainers
  - WWU Collection
  - COE Collection
- Special Projects
  - PISCES
  - NICS
  - Honeypot Stack
  - WAV-C
  - Virtual Internet
- Career Pathways / Learning Tracks
- Competitions Platform Integration
- Cyber Range Software Marketplace
- Remote Machine Templates
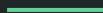- Open no cost access with no resource limits for WA.

Distributed, Highly Available

Pilot Program with Central Washington University.

In Progress
Planned

Version 3: General Availability

Fall/Winter, 2023

We are rolling out a lots of new features that were requested by students and teachers. V3 encodes our learnings.

+ No Cost
+ No VPN
+ No VM Limits
+ Integrated LMS
+ Single Sign On with participating colleges OR Create account online.

Universal equitable access to students - login anytime from anywhere on any device.

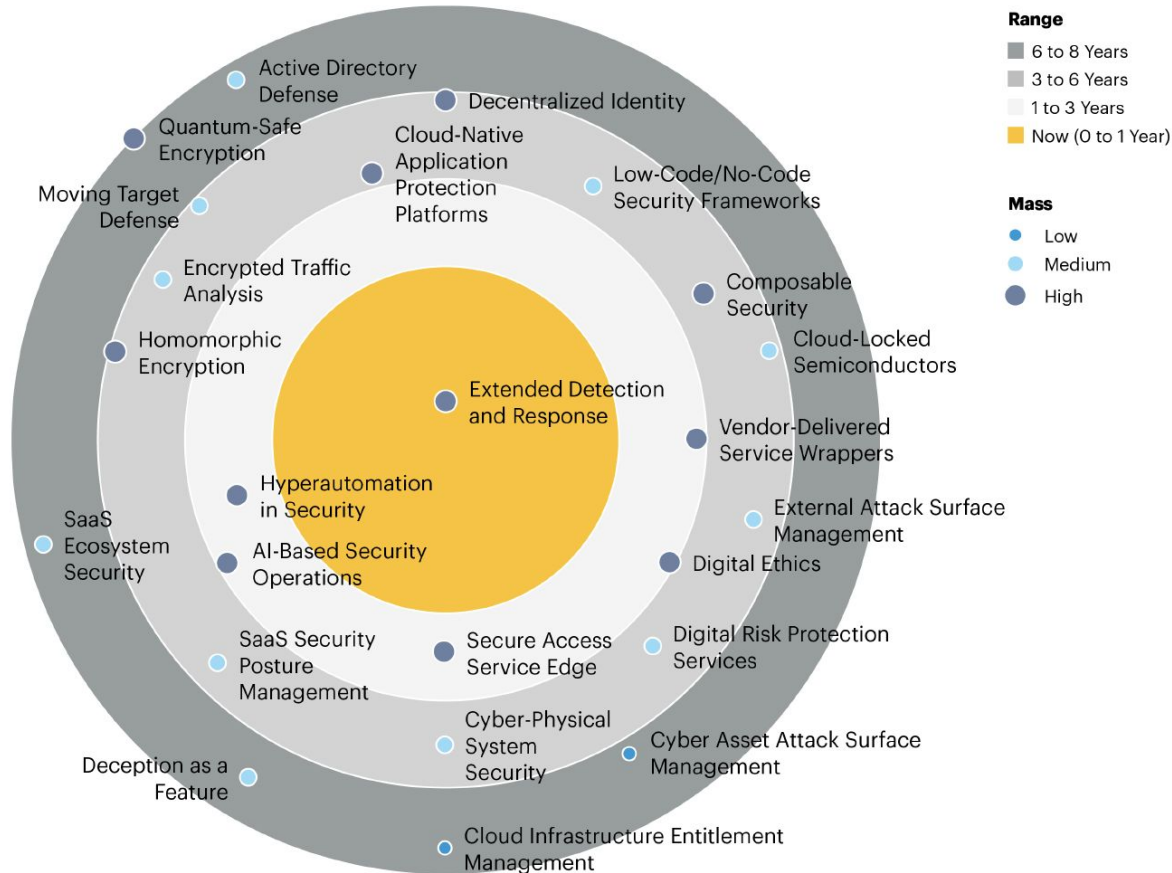https:/platform.cyberrangepoulsbo.org (Coming Soon)

State of Cyber Security Training / Lessons Learned

Problem Statement

Access to infrastructure and curriculum for cyber education & training is **fragmented**, **costly** and rely heavily on **proprietary** third party solutions.

Impact Radar for Security

Range
- 6 to 8 Years
- 3 to 6 Years
- 1 to 3 Years
- Now (0 to 1 Year)

Mass
- Low
- Medium
- High

Active Directory Defense

Decentralized Identity

Quantum-Safe Encryption

Cloud-Native Application Protection Platforms

Low-Code/No-Code Security Frameworks

Moving Target Defense

Encrypted Traffic Analysis

Composable Security

Cloud-Locked Semiconductors

Homomorphic Encryption

Extended Detection and Response

Vendor-Delivered Service Wrappers

Hyperautomation in Security

SaaS Ecosystem Security

External Attack Surface Management

AI-Based Security Operations

Digital Ethics

SaaS Security Posture Management

Secure Access Service Edge

Digital Risk Protection Services

Cyber-Physical System Security

Deception as a Feature

Cyber Asset Attack Surface Management

Cloud Infrastructure Entitlement Management

Source: Gartner
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Industry Landscape

Categorized by Topics

| Analytics | ICS | Identity & Access Management | Authentication | ITSM | Detection | Orchestration & Response | DevOps | Robotic Process Automation | Discovery | SIEM | Governance | HSM | Vulnerability Management |

Curriculum Landscape

Collection ^

- [ ] Cyber Heroes
- [ ] GenCyber
- [ ] Intro To Cyber
- [ ] Max Power
- [ ] NCyTE Center
- [ ] NICE Challenge
- [ ] NSA Funded Curriculum
- [ ] NSA NCAE-C Initiative
- [ ] National CyberWatch Center
- [ ] National Cybersecurity Workforce Development Program
- [ ] SEED Labs
- [ ] Secure Coding Community
- [ ] Security Injections
- [ ] The 502 Project

Topic ^

- [ ] Access Control
- [ ] Adversarial Thinking
- [ ] Blockchain
- [ ] Cloud Security
- [ ] Cryptography
- [ ] Cyber Law And Policy
- [ ] Digital Forensics
- [ ] Healthcare
- [ ] Human Factors
- [ ] Industrial Control Systems
- [ ] IoT
- [ ] Malware
- [ ] Network Security
- [ ] Operating Systems Security
- [ ] Principles Of Security
- [ ] Privacy
- [ ] Programming
- [ ] Quantum Computing
- [ ] Ransomware
- [ ] Reverse Engineering
- [ ] Risk Management
- [ ] Software Security And Secure Programming
- [ ] Software Supply Chain
- [ ] Web Security
- [ ] Zero Trust

Guidelines ^

- [ ] NICE Workforce Knowledge
- [ ] CAE CDE 2019
- [ ] APCSP
- [ ] NICE Workforce Tasks
- [ ] CAE Cyber Ops
- [ ] GenCyber-Concepts
- [ ] CSTA
- [ ] CS2013
- [ ] CAE Cyber Defense
- [ ] GenCyber-Principles
- [ ] CSEC
- [ ] NICE Workforce Abilities
- [ ] NICE Workforce Skills
- [ ] CAE-CDE Foundational Knowledge Units
- [ ] Cyber2yr2020
- [ ] CAE Cyber Defense Knowledge Units 2020
- [ ] CAE Cyber Operations Knowledge Units 2021
- [ ] DoD Cyber Workforce Framework KSATs

Source: Clark.Center

Certification Landscape
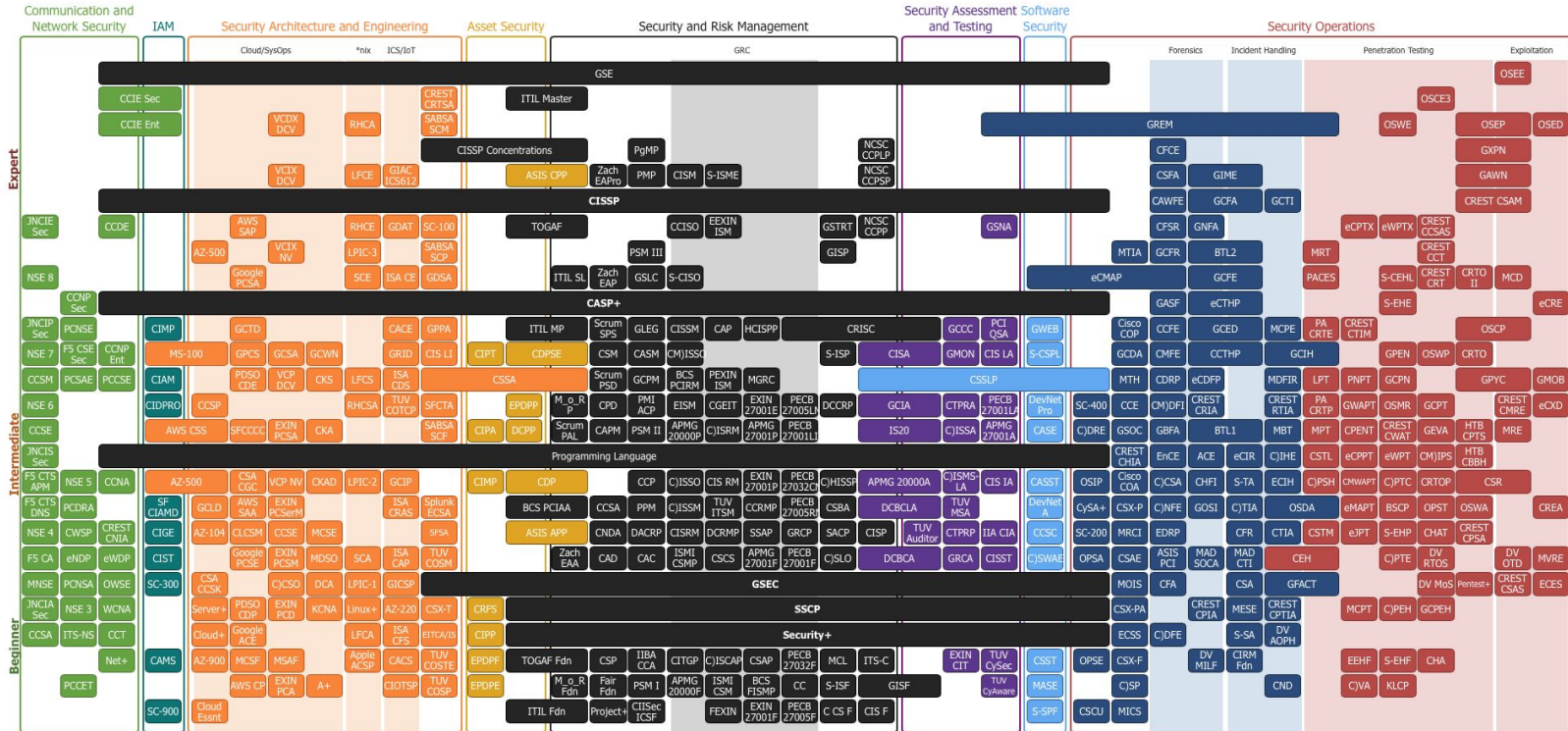
473 certifications listed

Source: StationX

Use Cases & Environment Requests

- Access to isolated secure environments
- Virtualized compute, networking, storage
- Access to cyber labs and exercises
- Cyber scenarios training
- Cyber warfare training
- Cyber competitions training
- Cyber workforce skills development
- Cyber camps for all levels
- Cyber research and development
- Cyber ethics, standards and compliance
- Security focused infrastructure services
- Incident Response and Readiness Training
- Critical Infrastructure Monitoring

Cyber Range Poulsbo

Simplify and unify the user experience openly and collaboratively.
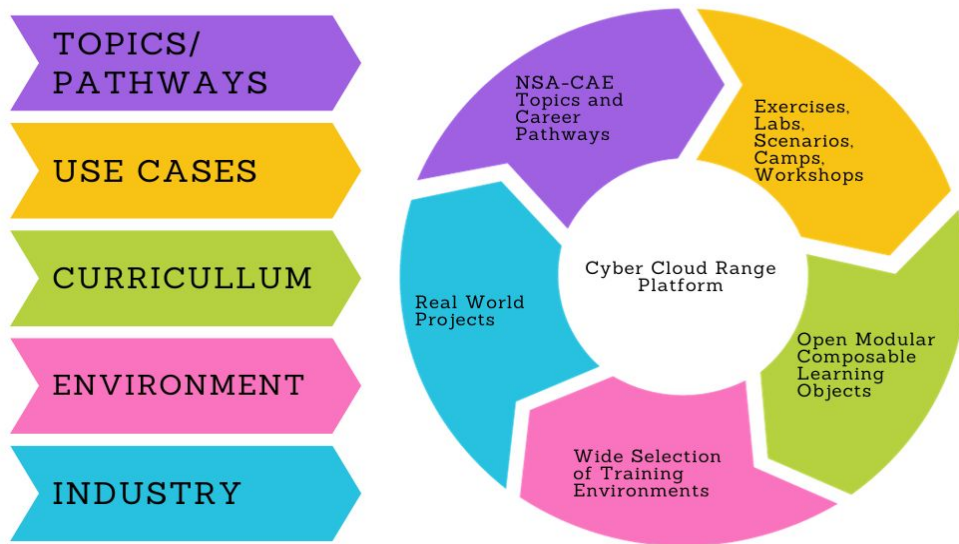
Please reach out

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