

Experiment, Test, and Assessment Platform

CHALLENGE

The cybersecurity domain lacks the fundamental scientific understanding to enable engineered solutions with predictable results. This has led to the current insecure cyber landscape. To resolve this deficiency, rigorous exploration of the cybersecurity domain must occur. However, the field currently lacks the capability to enable controlled and repeatable experiments in realistic environments.

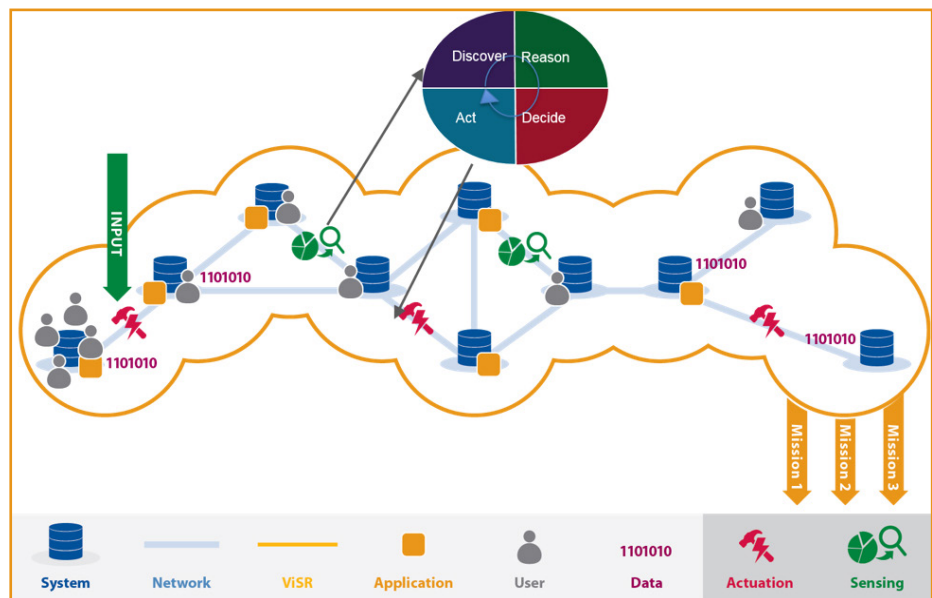
APPROACH

Pacific Northwest National Laboratory (PNNL) has developed CyberNET, a reconfigurable infrastructure which allows an instance of a functioning company to be created inside, enabling researchers to challenge the network and run tools on a live network in a realistic environment. Our environments contain real traffic, real applications, emulated users, real network components, real data, and a real mission.

CyberNET allows researchers to rigorously experiment on cyber technologies. This can be done in a number of ways, including:

- » Visiting or remotely connecting with PNNL
- » Having PNNL run the experiments on behalf of its researchers

Controlled, repeatable experiments in realistic cyber environments



CyberNET includes an instantiation of a fictitious company that is connected by networks, users, virtualized systems, routing fabric, applications, user models, and critical data – enabling rigorous experimentation of cyber technologies in realistic environments.

- » Asking PNNL to share the test environment so that researchers can run their own experiments.

METHODOLOGY

The CyberNET testbed was developed to strengthen cybersecurity research. CyberNET is a unique capability that provides the ability to emulate enterprise network environments to enable controlled experimentation that would not be possible in operational environments.

CyberNET offers a sterile and dynamic playground that is easily configurable and customizable where researchers can build, test, evaluate, or otherwise conduct their research in an enterprise-like environment.

- » CyberNET offers configurable and controllable cyber environment where realistic models can be executed using real software
- » CyberNET offers a scientific instrument where models can be generated, data can be collected for analysis, and the environment can be documented for repeatable and reproducible results

Uses for CyberNet include:

- » Experimentation
- » Testing and evaluation
- » Training
- » Prototyping
- » Technology demonstration

IMPACT

CyberNET accelerates the research of scientists and engineers while reducing cost, time, and redundancies across the cybersecurity domain. Enhanced modeling and simulation, supported by real world datasets, increase realism in models, leading to more relevant research.

The primary benefits offered by CyberNET include:

- » Cost-effective
- » Scalable
- » Repeatable and reproducible research
- » Remotely accessible
- » Quick and dynamic configurations
- » Expert support available

CyberNET also allows PNNL to facilitate the creation of a community of cyber experimentation using shared tools and experimental procedures.

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