

# Resilient by Design Platform for Cyber-Physical System Assessment and Validation

NATIG: Network Attack Testbed In power Grid

A comprehensive, modular, and flexible platform combining DOE-funded and open-source simulators to enhance resilience in power grids through realistic cyber and physical system modeling and attack scenario co-simulation.



**RESILIENCE THROUGH  
DATA-DRIVEN, INTELLIGENTLY  
DESIGNED CONTROL (RD2C)**  
@PNNL

Assessing resilience is vital for ensuring the high availability, security, and quality of power grids. Integration of distributed energy resources increases the grid's vulnerability to attacks, highlighting the need for reliable and realistic modeling techniques accessible to researchers. Simulation testbeds have emerged as essential tools, allowing for the modeling of real-world power grid topologies and the evaluation of disruptions.

NATIG (Network Attack Testbed In power Grid) is a standalone, containerized, and reusable environment designed for cyber analysts and researchers. NATIG integrates GridLAB-D, HELICS, and NS3 to offer an end-to-end simulation environment for power



grids, enabling the execution of diverse cybersecurity and performance scenarios. By generating a comprehensive library of realistic communication and physical models, datasets, and attack scenario configurations, NATI[P]G acts as a powerful tool for countermeasure creation against cyberattacks.

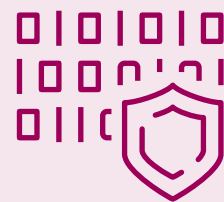
**NATIG makes it easy to address different science and technology questions, such as the ones below.**



Given an existing system, what are the most severe potential attacks that could compromise its resiliency and operational functionality?



Given a specific set of cyberattacks or failures, what is the most effective mitigation strategy to ensure an optimally resilient response?



How can we improve existing methodologies for assessing security and resiliency preparedness at sponsor installations, given that current approaches are manual, ad hoc, and incomplete?

## CONTACT

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**Open-source availability at:**

<https://github.com/pnnl/NATIG>

