

Security Considerations for the Smart Grid

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Trustworthy Cyber-Infrastructure for Power (TCIP)



- NSF “center-scale activity” awarded in 2005 to the University of Illinois
- General coverage
 - Devices
 - Networks
 - Load control
 - Modeling and simulation
- Renewed with DoE support in 2009 as TCIPG

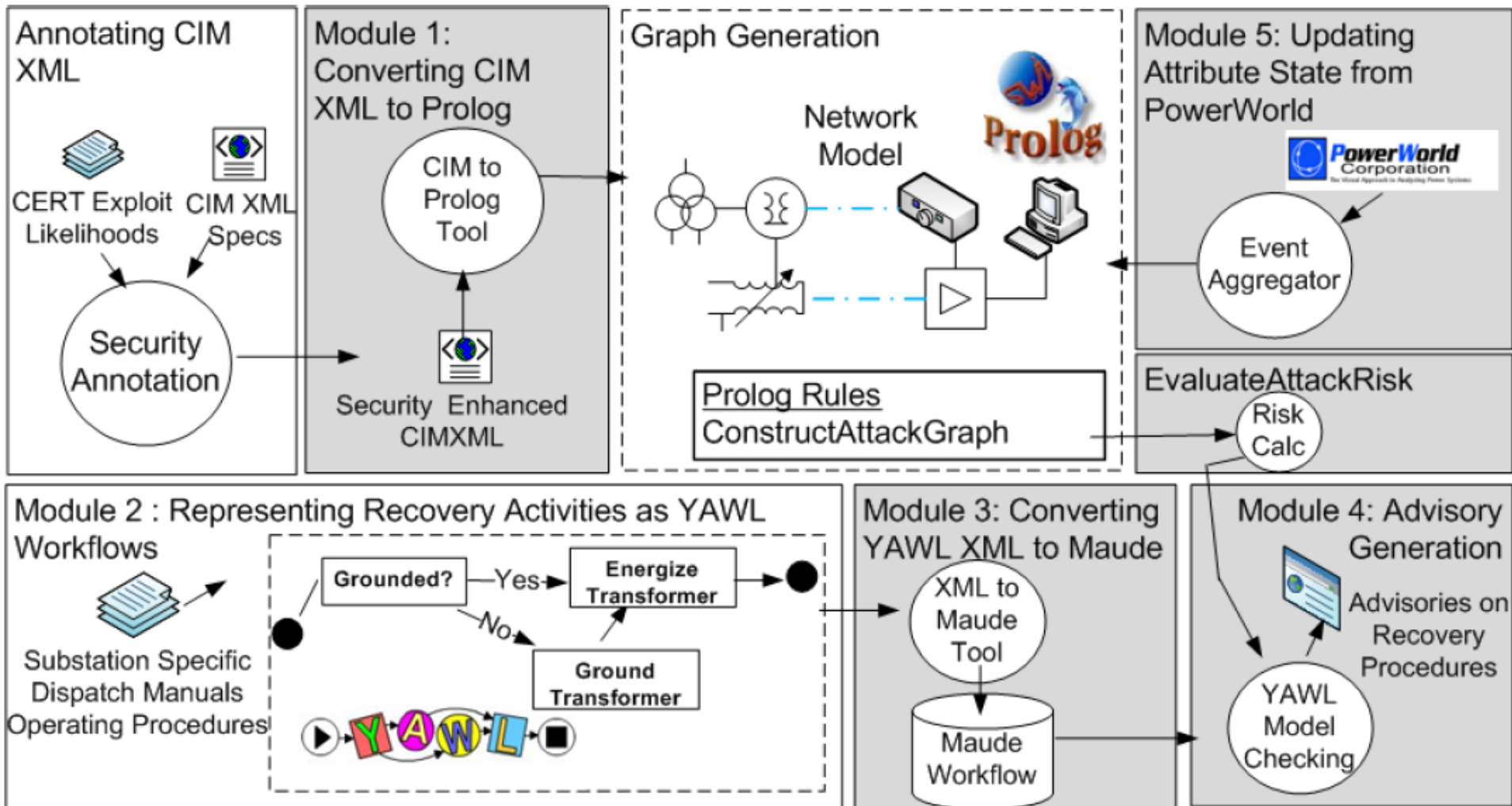
Automatic Assessment

- Zahid Anwar, Ravinder Shankesi, Roy. H. Campbell
- DSN 2008
- A collection of models and tools to enable quantitative analysis of trade-offs for security protections especially for power grid operations.

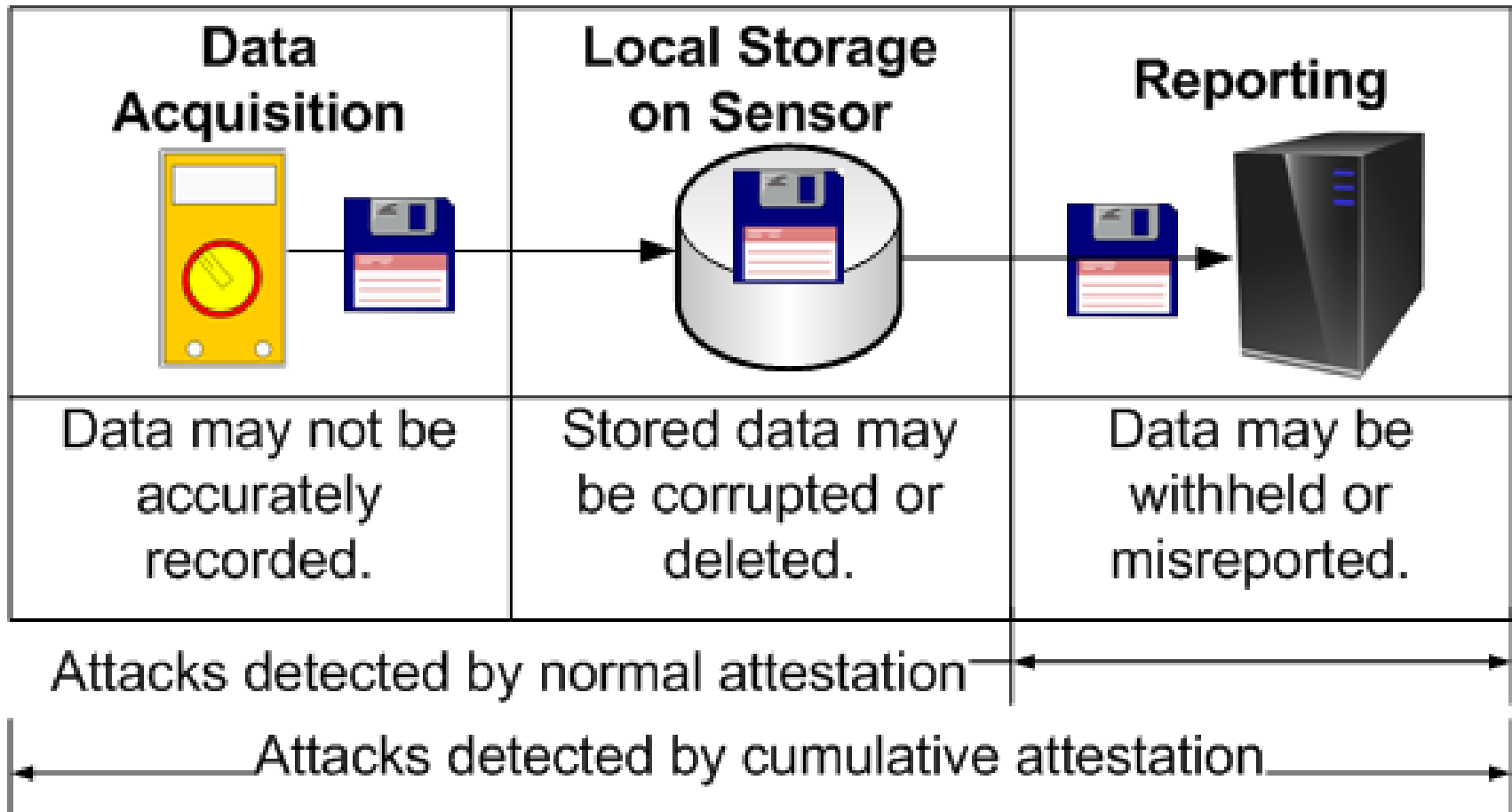
Attested Meter

- Michael LeMay, Carl A. Gunter
- ESORICS 2009
- An architecture and prototype for practical remote attestation for residential power meters.

Automatic Assessment Tool Chain



Cumulative Remote Attestation



Some Research Issues for the Future

- Managing keys for large numbers of small processors
- Providing an integrated model for the power network and the data network
- Real time security
- Outlier detection with malicious intruders

- How is it possible to assure reliable power systems when using the Internet?
- Are the Internet protocols appropriate for use in the Smart Grid?
- Given a clean slate for networking, is the Internet architecture the best choice for the Smart Grid?

What to Look Out For

- New ideas, some silly but some potentially transformative. Keep an open mind on research ventures.
- The next generation of students.