

# Cyber Security



Our nation relies heavily on computer-based information technology to manage its critical infrastructure, including telecommunications, banking and finance, transportation, health care, energy, and defense. As our reliance on information technology grows, so does the need to protect these vital systems from threat and manipulation. Cyber security research creates new technical, economic, social, and behavioral knowledge that organizations and policy makers can use to identify where and why vulnerabilities exist and to guide policy and strategy development to reduce threats and mitigate risk.

While no single approach can provide sustained protection against the unpredictable nature of cyber attacks, the breadth and depth of RTI International's knowledge base is well suited to multifaceted, investigational research. RTI offers advanced expertise in computing, information, social, economic, and engineering sciences that can be applied to better understand the challenges and issues surrounding cyber security.

We have performed work in the cyber security arena for a number of federal clients, including the Department of Homeland Security, the National Institute of Standards and Technology, the National Institutes of Health, and the Department of Health and Human Services, as well as state and local law enforcement agencies.

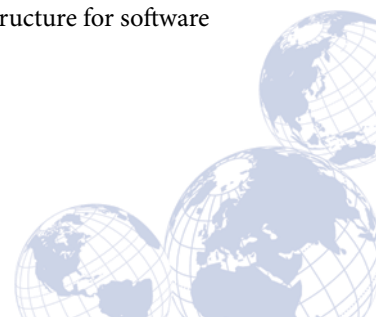
## Our Expertise

The following examples highlight RTI's cyber security work in specific areas of research and describe capabilities that can be brought to bear on the complexities of the cyber security challenge, both nationally and globally.

## Economic Analysis and Modeling

Targeted economic analysis and modeling can support informed decision making by providing a foundation for policy discussion, delineating costs and savings, and predicting the ramifications of a policy or strategy at multiple levels. Our researchers have provided analytical and modeling support to

- Estimate the demand for internet service providers to provide more security to home internet users and analyze the associated costs and barriers
- Estimate the net economic impact of the Role-Based Access Control standard on government, business, and software developer stakeholders
- Identify economic barriers preventing the private sector from making private and socially optimal cyber security investment decisions and investigate possible government actions
- Estimate the potential cost savings associated with an improved, socially optimal infrastructure for software testing.



### Analysis of Security Policies and Intervention Strategies

At RTI, researchers are analyzing organizational policies related to securing personally identifiable information, particularly health information being shared among health care providers, public health agencies, and consumers. We are also assessing the impact of various interventions aimed at improving organizations' perceptions about cyber security. We are using our expertise to

- Evaluate the impact of intervention strategies—for example, training and threat briefings—on the cyber security knowledge, attitudes, beliefs, and behaviors of small businesses
- Analyze security and privacy business practice issues likely to be encountered as part of a nationwide health information network
- Develop a set of model anti-fraud requirements for electronic health record systems.

### Data Storage, Access, and Anonymization

RTI researchers are developing methods and tools for sharing data of varying degrees of sensitivity with members of the cyber security research community who are investigating issues and developing solutions to defend against cyber threats. We are using our computing expertise to

- Manage, coordinate, and facilitate the acquisition and delivery of Internet traffic data from data providers to researchers through a distributed, restricted-access data repository called PREDICT
- Develop sensor devices that prevent “insider threat” through system and network analysis
- Address legal and ethical issues involved in storing and providing access to cyber security–related data for research purposes
- Identify disclosure control methods and assess their use for sharing sensitive data.

### Institute for Homeland Security Solutions

RTI International is part of the Institute for Homeland Security Solutions (IHSS), a collaborative initiative between RTI, Duke University, the University of North Carolina at Chapel Hill, and the North Carolina Military Foundation. IHSS is a research consortium established to conduct applied research in the social and behavioral sciences to address a wide range of homeland security challenges.

### Additional Capabilities

RTI has additional expertise that could be useful in the analysis of cyber security investments and solutions.

### Data Capture, Data Mining, and Predictive Analytics

Information capture and analysis has broad applications in support of surveillance systems, needs assessments, program evaluations and monitoring, terrorist profiling, and other homeland security studies. RTI staff have used their capabilities in these areas to

- Perform data mining for hostile surveillance patterns and determine whether suspicious activity reports can be explored and modeled to make recommendations for terrorism prevention and deterrence efforts
- Evaluate and test specific tools for intelligence analysis, including data mining applications that can be used for open-source data and unstructured text
- Use simulation modeling to estimate potential scenarios and responses to threats.

### Criminology and Law Enforcement

RTI researchers conduct studies on criminal justice, violence, and terrorism-related topics that would be useful in the analysis of cyber crime and cyber attacks. We have used our expertise to

- Develop analytical tools that use modeling and simulation to interpret the motivations and behaviors of violent groups and to identify factors indicating that a group may engage in ideologically motivated violent activity
- Facilitate an internet radicalization workshop that brought together social and behavioral science researchers to study the impact of the Internet on the process of radicalization and the recruitment of terrorists.

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### More information

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RTI International is a trade name of Research Triangle Institute.

