



Supporting Biodefense by Speeding Development of Countermeasures

The threat of terrorist attack with a biological, chemical, or agricultural agent can be countered by quickly identifying drug leads to treat the related afflictions. United Devices grid technology can exponentially accelerate Virtual High-Throughput Screening used in the initial stages of drug discovery.

Proven Success:

The Smallpox Research Grid Project

Sponsored by the U.S. Department of Defense, United Devices, IBM, and Accelrys, the Smallpox Project is one of the largest computational research projects ever undertaken. Of global relevance, the Project involves the screening of 35 million molecules as potential candidates for a smallpox anti-viral drug.

Launched on February 5, 2003, the Smallpox Project has already generated nearly 11,000 years of CPU time for this critical research.

"We hope to contribute to the elimination of smallpox as a potential weapon of mass destruction. We're excited to partner with these top technology and bio research organizations in the fight against terrorism."

*-Dr. Scott Kahn
Chief Science Officer, Accelrys*

The Challenge: Shortening the time it takes to identify drug candidates to reduce the overall timeline for developing vaccines and cures

Biological weapons have been called the "poor man's atomic bomb" (Block, 2001). The know-how and process technology to produce such a weapon is widely available via access to internet-based information sources, and these bioweapons can easily be enhanced using microbial genomics and genetic engineering (Dennis, 2001). In addition, the materials used to develop biological weapons are as accessible as the knowledge – a great many toxins and bacterial / viral strains are available which can be used for this purpose (Breithaupt, 2000).

Although vaccinations and drugs exist for some of these organisms, many strains have gained resistance to (or can be engineered to resist) treatments, thus posing a great threat to society. Because many of these deadly agents are available on a growing scale, **creating a defensive capability to accelerate the drug discovery process is a critical priority.**

With recent advances in Virtual High-Throughput Screening (VHTS), biodefense researchers hope to speed drug discovery in both proactive projects and as a reactive capability in the event of attack. Unfortunately, the amount of data that must be processed in this work is immense. Outside of purchasing expensive high-performance hardware, agencies have few options in meeting the processing needs of these VHTS applications. **Project BioShield mandates that government agencies involved in this work speed research and development of medical countermeasures and identify leads faster and more accurately than current methods allow.**

The Solution: How United Devices grid technology can improve productivity in biodefense research

By using United Devices' grid technology, researchers can significantly speed their lead-finding processes significantly, thereby reducing the timeline for developing vaccines and cures. United Devices grid technology will allow agencies to:

- **Speed development of biodefense candidates** by harnessing high-performance compute power to increase processing speed and reduce discovery timelines
- **Improve operational productivity** by maximizing utilization of existing resources for HTS processing
- **Increase the scope of research** with a high-performance solution that can handle larger amounts of critical data – so agencies can leverage the available, massive libraries of drug information
- **Ensure emergency preparedness** by presenting options for rapidly increasing available compute power in a secure, scalable manner



Proven Success:

The Anthrax Research Project

Sponsored by the U.S. Department of Defense, United Devices, Intel, and Accelrys, the Anthrax Project was the groundbreaking project in large-scale biodefense initiatives.

Run on United Devices' global research grid, the Anthrax project succeeded in screening 3.57 billion molecular compounds against a known Anthrax toxin target in just 24 days. The resulting data was presented to the U.S. Department of Defense for further lab exploration and development.

"These results are unprecedented. Had we done this using traditional methods, it would have taken years instead of less than 4 months."

–Dr. Graham Richards, Chairman of the Chemistry Department at Oxford University, commenting on Anthrax Toxin Screen

"The Department of Defense...looks forward to enabling technology advances through molecular design studies based on the structures of the compounds that have been identified."

–Dr. Anna Johnson-Winnegar, Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense



12675 Research Blvd.
Building A
Austin, TX 78759
Ph.512.331.6016
Fx.512.331.6235
www.ud.com

Security: Protecting data, applications, and systems from both internal and external compromise is mission-critical

Technologies that interact with government systems must exhibit the highest standards of data, application, system, and user integrity.

United Devices' grid infrastructure features **the most comprehensive security implementation** for grid solutions available. Our technology ensures that all critical application and data are secure, authenticated, and validated across every aspect of the grid. United Devices understands the critical nature of government data and has delivered industry leading security mechanisms across server, network and end-node facilities.

Specific security features include:

- **Secure runtime environment** to protect application execution from tampering and interception
- **Automatic Triple-DES encryption and compression** of data over the network and on disk
- **Configurable thresholds** to monitor and control the impact on devices
- **Non-invasive and invisible execution** on servers, clusters, desktop PCs and laptops
- **Digital signature validation** of executable code modules

"Intel said the software's security is 'robust end to end.' Barrett [CEO of Intel Corp] said he was going to allow it to be run inside his company."

*Mark Hall
ComputerWorld*

"We are deploying technology that will be applicable not only for finding a cure for smallpox, but in the future can be easily adapted for other challenges."

*Michael R. Nelson
Director for IBM's Internet Technology and Strategy*

About United Devices

United Devices is the global leader in secure grid solutions. The company's Grid MP™ platform is used to aggregate compute resources on a network to create a compute grid capable of running a wide range of high-performance computing applications in government research as well as a variety of commercial industries. The company's solutions are available as both enterprise and on-demand deployments. United Devices also operates the world's largest grid for grand-scale research, consisting of more than 2 million devices in over 220 countries.

For more information on United Devices grid technology, visit the United Devices Web site at www.ud.com.