



Labs Accomplishments 2011

1. Please check the ONE most-appropriate category:

<input type="checkbox"/> Nuclear weapons engineering (incl. surety, survivability, etc.)	<input type="checkbox"/> Weapons security (safeguards, transport, incident response, etc.)	<input type="checkbox"/> Product realization (incl. NW design, manufacture, etc.)
<input type="checkbox"/> Remote sensing (electronics for global awareness, verification, surveillance, reconnaissance, etc.)	<input type="checkbox"/> Military programs (incl. military systems, missile defense, defense technology products & support, etc.)	<input type="checkbox"/> Energy (nuclear energy, alternative energy, fossil fuels, water, energy security, etc.)
<input type="checkbox"/> Global security (nonproliferation, global threat reduction, international maritime security, etc.)	<input type="checkbox"/> Homeland security (incl. materials detection, event mitigation, force protection, border security, etc.)	<input type="checkbox"/> Infrastructure protection
<input type="checkbox"/> Bioscience	<input checked="" type="checkbox"/> Computer & information sciences (incl. modeling & simulation, visualization, etc.)	<input type="checkbox"/> Engineering sciences (incl. experimentation, validation, predictive simulation, etc.)
<input type="checkbox"/> Materials (nano, materials processing, reliability, etc.)	<input type="checkbox"/> Microelectronics & Microsystems	<input type="checkbox"/> Pulsed Power
<input type="checkbox"/> Partnerships & alliances	<input type="checkbox"/> HR, Finance, & Legal	<input type="checkbox"/> ES&H & Security
<input type="checkbox"/> IT, networks, & facilities	<input type="checkbox"/> Supply chain	<input type="checkbox"/> Other (specify): Click here to enter text. (ex.: Management)

2. SMU: Indicate which SMU(s) this project supports (required)? DS&A

3. Description of accomplishment: Be brief (**85 words**) and lively. Remember that this is for a general audience. Emphasize significance and/or potential application, interest to customers, etc. Avoid acronyms. Include center numbers at end of item for all centers that made significant contributions. Accomplishment should have occurred largely during FY10.

[Write here: 85 words or less]

The Defense Advanced Research Projects Agency (DARPA) has selected a Sandia-led team called X-caliber as a performer in the Ubiquitous High Performance Computing (UHPC) program. The goal is to reinvent computing to enable embedded tera-scale computing consuming about the same power as a light bulb, field-deployable petascale systems, and power-efficient national scale supercomputers. The team is focused on novel memory systems and a highly multi-threaded execution model to achieve these audacious energy goals, and includes major industry and academic partners.

4. Illustrations: IMPORTANT: If you have a photo, drawing, or chart, please provide it, along with a brief caption. Submit electronically via e-mail in jpg, tif, PhotoShop, or other common format. (PowerPoint images or images embedded in Word files don't work well.) Please be sure to label any separate graphics file in such a way that it can be readily associated with the written submission.

[Caption here: Please note filename for graphic]

This is the notional design of an X-caliber computer note. The design features two processors (Ps) for high temporal locality processing. Each P is supported by advanced memory devices

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(Ms) that also include embedded memory processors (EMPs) to handle low temporal locality processing. Finally, each node includes a pair of network interface chips and routers for inter-node communication.

5. Submitted by: (include name, phone, org. number, and email): Richard C. Murphy, 1422, 844-7122, rcmurph@sandia.gov