Sandia National Laboratories and Scientific Computing

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Scalable System Software

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Exceptional

service

in the

national

interest

U.S. DEPARTMENT OF ENERGY

NNSA
National Nuclear Security Administration

Who am I?

- Graduated from Brookwood HS in 1988

- Georgia Tech BS in Computer Science 1993

- Worked in Industrial Controls and Healthcare Software

- Entered Georgia Tech grad school 2002

- Georgia Tech MS in Computer Science 2004

- Georgia Tech PhD in Computer Science 2010

What is Sandia National Laboratories?

- Part of Los Alamos during Manhattan Project
- Independent in 1948
- Very diverse engineering focus
- Solve World-Scale engineering problems

Sandia's Impact

Cleanroom invented 1963

$50 billion worth of cleanrooms built worldwide It's used in hospitals, laboratories and manufacturing plants today.


9/11

Sandia sets contingency plans for release of materials and aircraft attacks on critical facilities immediately after 9/11. Search dogs are equipped with cameras for search and rescue K-9 handlers. The capability allowed search efforts to be carried out in spaces inaccessible to humans.

2008 Satellite Takedown

Red Storm computing helps shoot down rogue satellite.
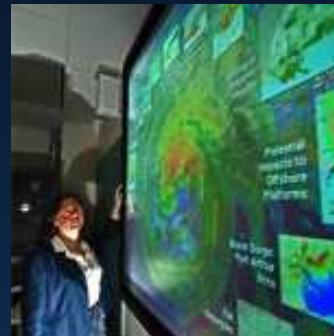
Hurricane Katrina

Sandia is called to assess flooding and infrastructure failures.

Fukushima Quake

Sandia helps cleanup radioactive wastewater.

Gulf Oil Spill

Sandia works to help to develop an approach for securing the damaged well head, stopping the leak, and minimizing the severity of the oil spill.

Why Scientific Computing?

- Programming since 10 years old

- Easily bored if not constantly learning

- Modern science heavily dependent on computing

How Big are the Computers?
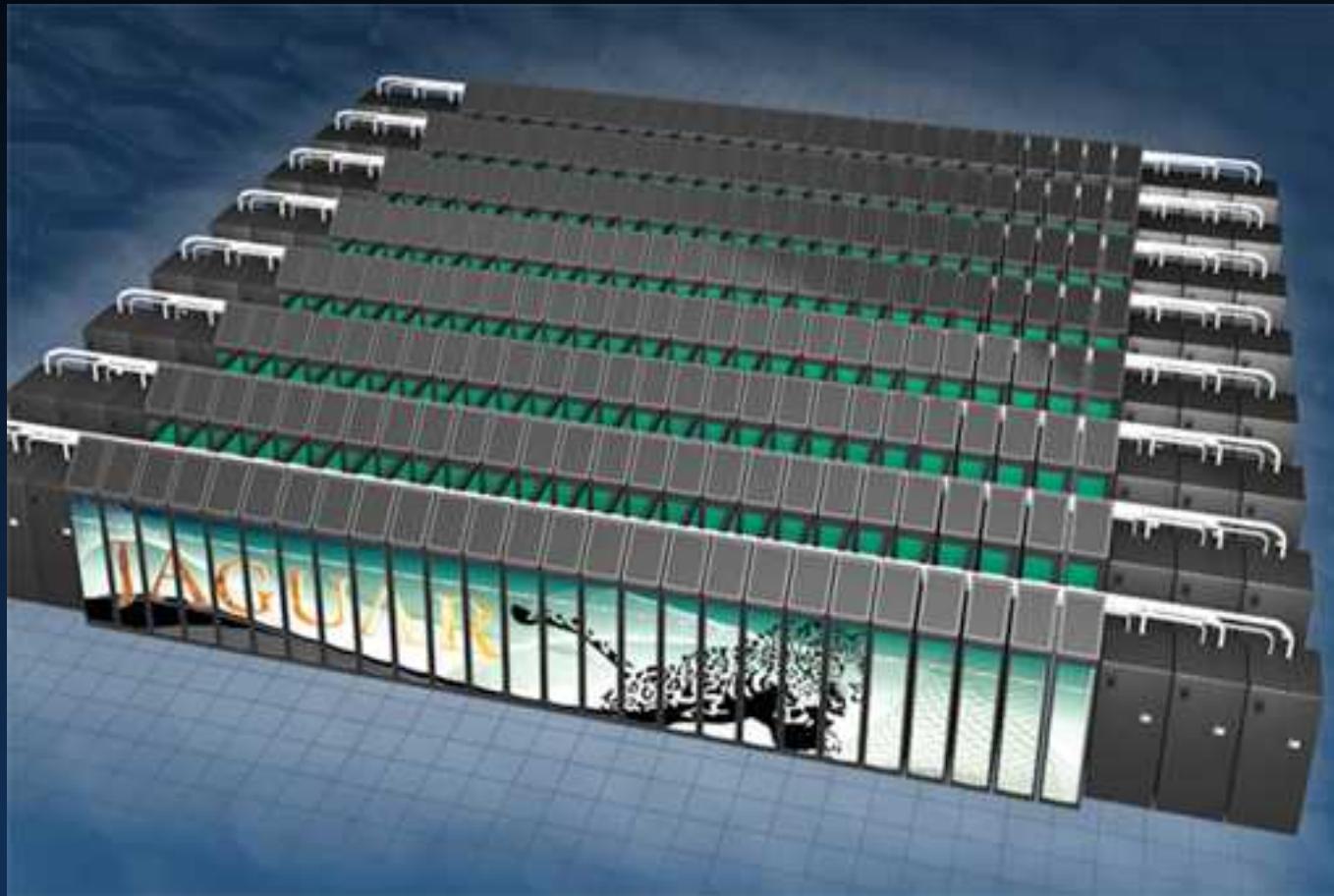
How I got Here

1. Get really good at programming
2. Relearn almost everything for big machines
3. Identify current and projected computing problems
4. Help physical scientists make discoveries

"Typical" Day

- Read research papers
- Formulate ideas
- Write code
- Run LOTS of tests
- Write research papers
- Write grant proposals
- Talk with people in the community
- Give talks about ideas and research papers

Questions?

Sandia is a National Laboratory

Steerable Bullet