Alabama Supercomputer Center
Alabama Research and Education Network
The Alabama Supercomputer Center for High School Students
updated January 2013

• Alabama Supercomputer Authority
• How supercomputers are used
• Computer related jobs
Alabama Supercomputer Authority

- Supercomputer resources for academic use
- Network connections to schools
- Alabama Virtual Library (AVL)
- Alabama Learning Exchange (ALEX)
- ACCESS distance learning
- Software development
- Web & Email hosting
Medicine

- Understanding diseases
- Inventing new medicines
Chemistry

- Making new materials
- Man made diamonds
Fluid Dynamics

- How liquids flow
- How a storm develops
Making Movies

Images courtesy of Pixar animation studios
Making Movies

Uses

TERMINATOR 3

SHREKINATOR 3
Computer Science

- Writing software
- Designing computers
Physics

- Simulations of collisions between galaxies
- Earth's magnetosphere
Electrical Engineering

- Simulations of aircraft being struck by lightning
Mechanical & Aerospace Engineering

- Simulations of structural strength of mechanical parts
SGI UV Supercomputer

- 268 Xeon “Sandy Bridge” Processors
  - 5,194 GFLOPS Peak

- Shared Memory Architecture
  - NUMAlink shared memory network

- Memory (4TB per node)
  - 4,160 GB Total

- Disk Storage
  - 15 TB shared
Dense Memory Cluster (DMC)

- 1,800 x86-64 Processors (AMD/Intel)
  - 16,462 GFLOPS Peak
- Shared/Distributed Memory Architecture
  - InfiniBand high speed/low latency network
- Memory (24-128GB per node)
  - 10,136 GB
- Disk Storage
  - 225 TB internal, 20 TB shared
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Historical Perspective

Cray X-MP
1987

Cray C90
1994

SGI Altix 350
2004

Altix 450
2006

UV 2000
2012

Cray SV1
1999

Cray XD1
2004

DMC
2008

An eternity in computer years

9 node network

nCube
1991

UV 2000
2012

640 node network
Accounts are free for faculty and students at public schools and universities in Alabama.

The exception is that work being done by university researchers under contract to commercial companies is not free.

Students can get accounts that last while they are in school, or class accounts that last for a single semester.
What Next?

- Faster Computers?
- Smarter Computers?

“We couldn’t afford faster computers, so we just made them sound faster.”
How to get a computer related job

- Go to college
- Take math classes
- Take computer classes
- Learn to type
- Try doing computer projects outside of class
There are about 6,080 modeling and simulation jobs in Alabama (2004 survey by B. Schroer).

There are network and system administration jobs at companies, schools, and government agencies throughout the state.

In January of 2010, there were over 200 of the jobs mentioned in this presentation listed at www.jobcentral.com just in Huntsville.
Average Salaries

2010 Averages for Huntsville, from salary.com

- Web/database Developer $66,575
- Network Engineer III $77,118
- Systems Administrator $66,623
- Computer Technician $39,309
- Helpdesk Operator $40,647
- Supercomputer Analyst $83,536
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