

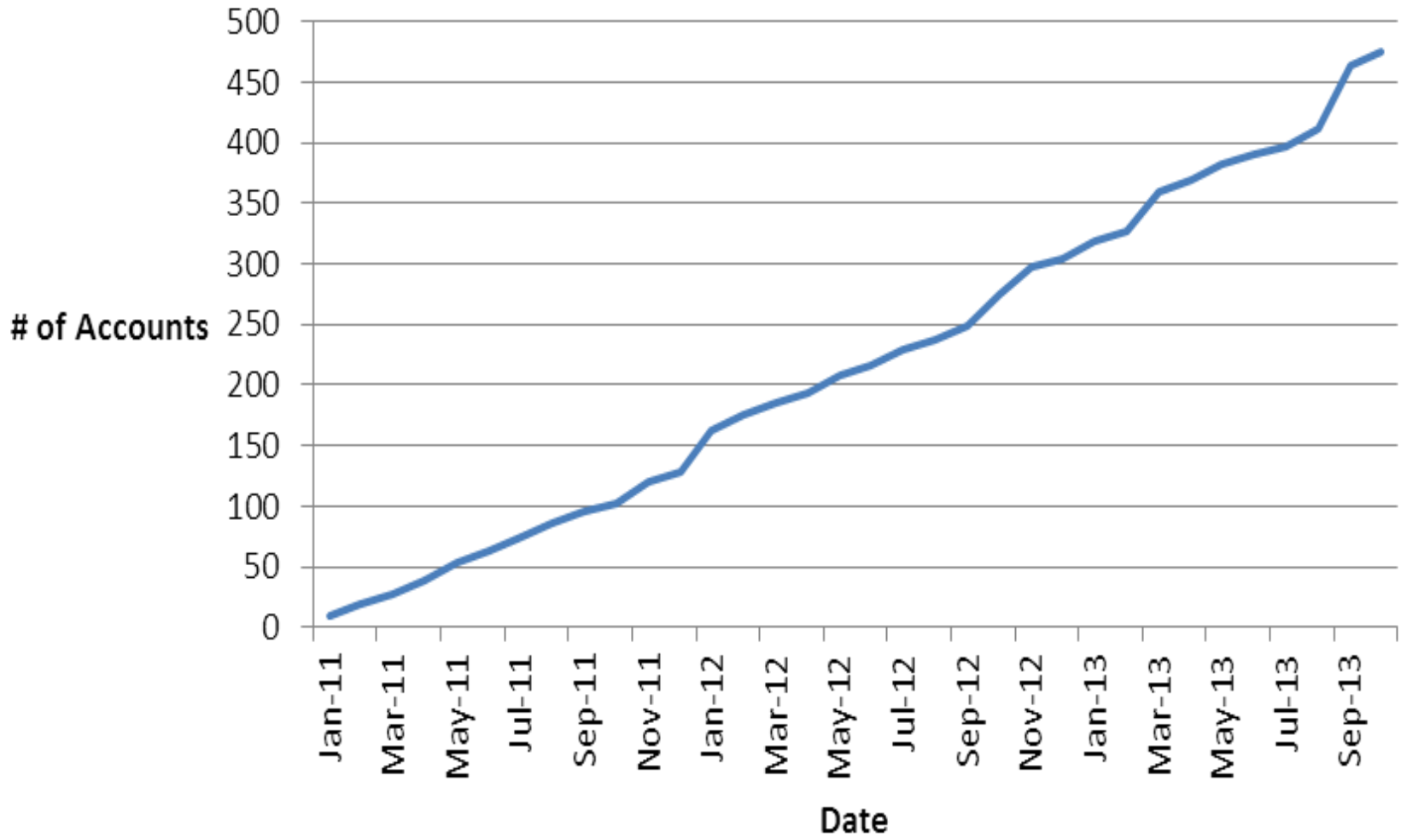
ISTeC CSU Cray XT6m

High-Performance Computer

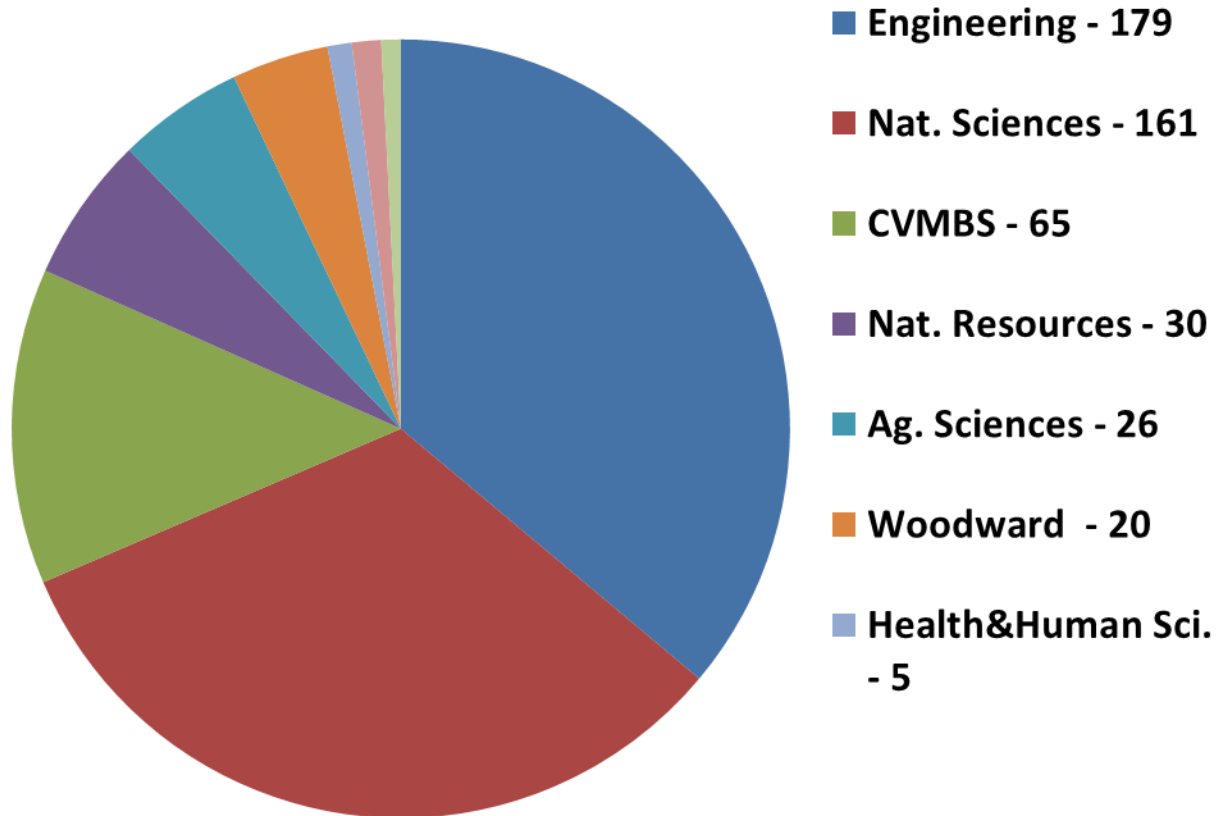


- Funding
 - \$640K NSF grant
 - 50/50 engineering & life sciences content
 - PI's: Pat Burns & HJ Siegel
- Specs
 - 2,016 CPU cores
 - 2.5 TB RAM
 - 32 TB disk
 - 19 Teraflops / sec.
- 500+ CSU user accounts + Woodward Governor & Boeing grant
- Many colleges and departments, diverse disciplines
- Publications, grants, conference proceedings
- Software/Databases: ca. 150 apps & DB's
- Staff
 - ½-FTE manager
 - ¼-FTE sysadmin
 - ½-FTE grad student (occasional)
- Total Cost of Ownership: ca. \$200K / yr.

ISTeC CSU Cray Accounts



ISTeC Cray Usage by College
Nov. 2013: 495 Total Users



Applications & Databases Installed on Cray

“R” statistical package & 50+ “R” modules

Rmpi
Abyss
Allinea
Ampliconnoise
ANSYS
ARDB
ATLAS
BioPerl
BLAS
Boost
Bowtie
Breeze
CFDPlus
Converge
CPLEX
Cufflinks
Egenix
Expat
Fastx Toolkit
GAMESS
GDAL
Genbank
GHC
Greengenes
GSL
Hwloc
JSpecies
Knitro
LAPACK

MACS
Mercurial
Metacomp
MetaVelvet
Migrate
Mira
Mono
Mothur
MPE
mpiBLAST
MUMmer
MySQL
NCBI databases
NCBI-Blast
NETcdf
Numpy
NWchem
Oases
OpenBUGS
Openeye
OpenEye Suite
OpenFOAM
OpenMPI
Parallel-NETcdf
Pasha
Pauda
pBWA
PeakSplitter
Plexos
PostgreSQL

PyCogent
Python
Qiime
Ray
RayDenovo
RayMeta
RDP
RepeatMasker
RMblast
RPPR
Samtools
Scipy
Shore
SILVA
Smoldyn
SOAPdenovo
SOLID System de novo Assembly Tools
SortmeRNA
Sprng
Staden
Subversion
Tau
Tophat
Totalview
TrinityRNASeq
UPP
Velvet
VelvetOptimiser
Visit
WGS

WRFV3
Xcms
Zlib

Cray Used in Courses

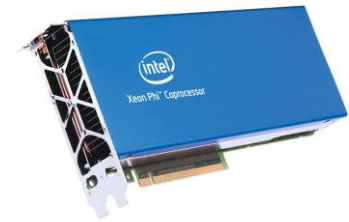
GRAD511: "High Performance Computing and Visualization"
GRAD510: "Fundamentals of High Performance Computing"
CS475: "Parallel Programming"
CS675: "Advanced Parallel Computing"
CS560: "Foundations of Fine-Grained Parallelism"

Cray Used in Publications Etc. (NSF Final Report 11/27/2013)

Journals: 36
Book chapters: 3
Theses/Dissertations: 2
Conference papers: 45
Other: 2

CSU MIC Cluster

- Launched August 2014
 - Internal \$25K grant
 - 8 CPU cores
 - 180 MIC cores – Intel Phi Coprocessor
 - 24 GB RAM
 - 8 TB disk
-
- Makes accelerators available to CSU community



Benefits of a Campus Resource – One Alternative

- Research computing hardware
 - Attractor for new faculty
 - Supports advanced education
- Stable hardware & software environment needed for multi-year development efforts
 - HPC is hard and requires sustained effort
 - Foundation for intellectual development
- Data locality for tasks that use “big data”
- We install software apps at user requests, custom for CSU researchers
- Resource easily & quickly available
- Other alternatives will be discussed