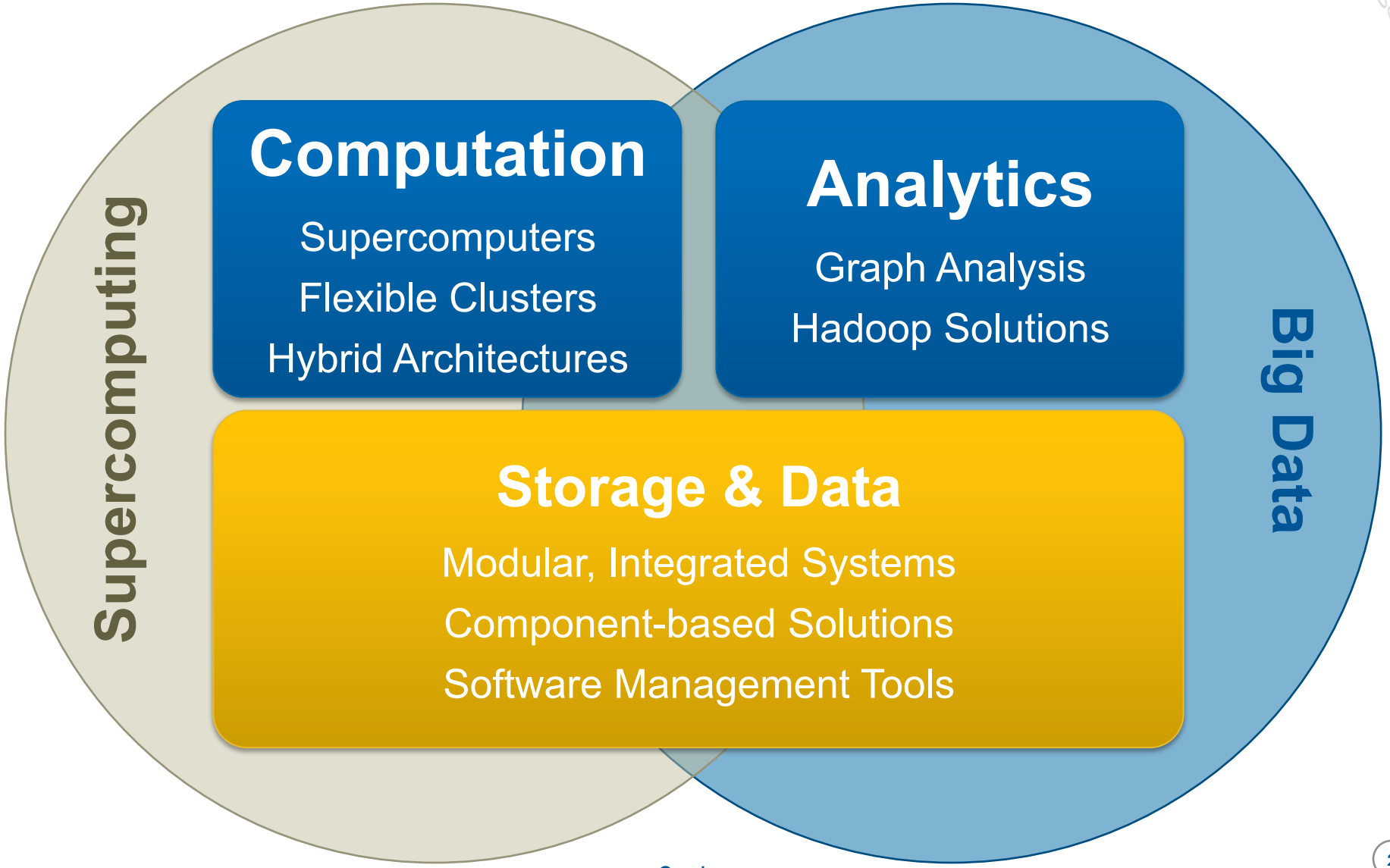
Cray Lustre and Scalable Storage Solutions Overview

LUG 2013 Vendor Presentations

We build computational tools to help change the world!



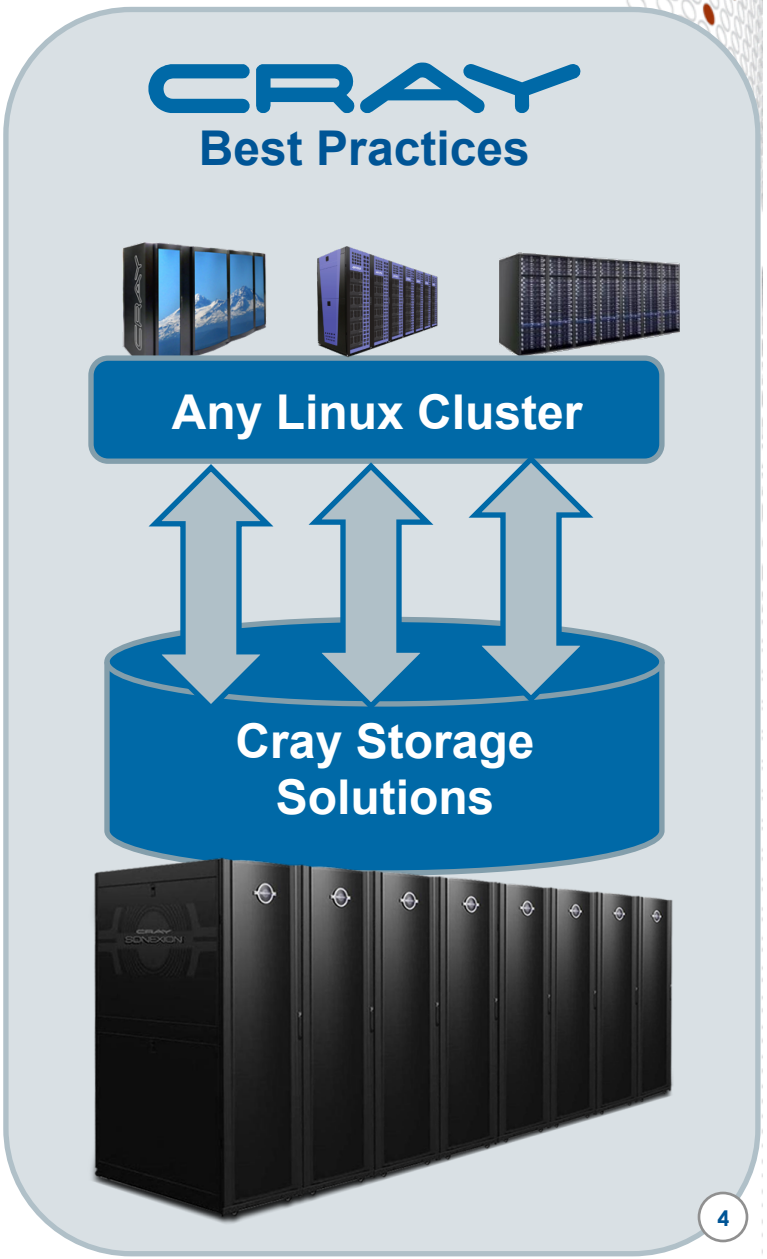
Community and Open Standards

- Linux-based OS's in all products
- Industrial Partnership Programs
  - NCSA
  - ORNL
  - BICB
- OpenSFS Lustre Community
  - Founder
- OpenACC
  - Founder
- OpenMP
  - Member
- Infiniband Trade Assoc.
  - Board Member
- Open Fabrics
  - Member
- Cray User Group (CUG)
  - Meetings yearly with 200-300 attendees.
- SparQL

Cray Scalable Storage Solutions

Experts in Data- and IO-Intensive Big Data & HPC

- **Scalable Storage Systems**
  - Cray Sonexion™
  - Component-based Solutions
- **Data Management Platform**
  - Cray Lustre File System
  - Cray Development and Login
  - Cray Data Movers
  - Cray Management Services
- **Data Virtualization Services**
  - Virtualize IO to diverse file systems
    - NFS, GPFS, PanFS, SAM QFS, Lustre
  - Burst Buffer building blocks + SSD



Cray Scalable Storage Solutions for Big Data and HPC

Cray is your trusted storage expert for big data and HPC. Cray helps you utilize the right storage, build on open systems, and get results faster.

Your Trusted Expert

- Fastest production Lustre file system
- Top 100 storage – 16% Cray installed
- Leading open source community (Lustre 2/3 of top 100 sites)
- Exascale vision and leadership

Your Choice of Storage

- Your choice of storage —utilizing Cray's best practices
- Flexible data management services
- Open systems
- Linux cluster agnostic

Get Results Faster

- Deliver solutions on-time
- Solutions perform as advertised
- Reduce storage footprint by 50% for petascale systems

Any Linux Cluster for Big Data and HPC

Case Studies

Enabling Scientific Breakthroughs at the Petascale

NCSA Today

Size	Used	Avail	Use%	Mounted on
2.0P	478T	1.5P	25%	/mnt/a
2.0P	1.4P	607T	70%	/mnt/b
20P	13P	6.7P	66%	/mnt/c

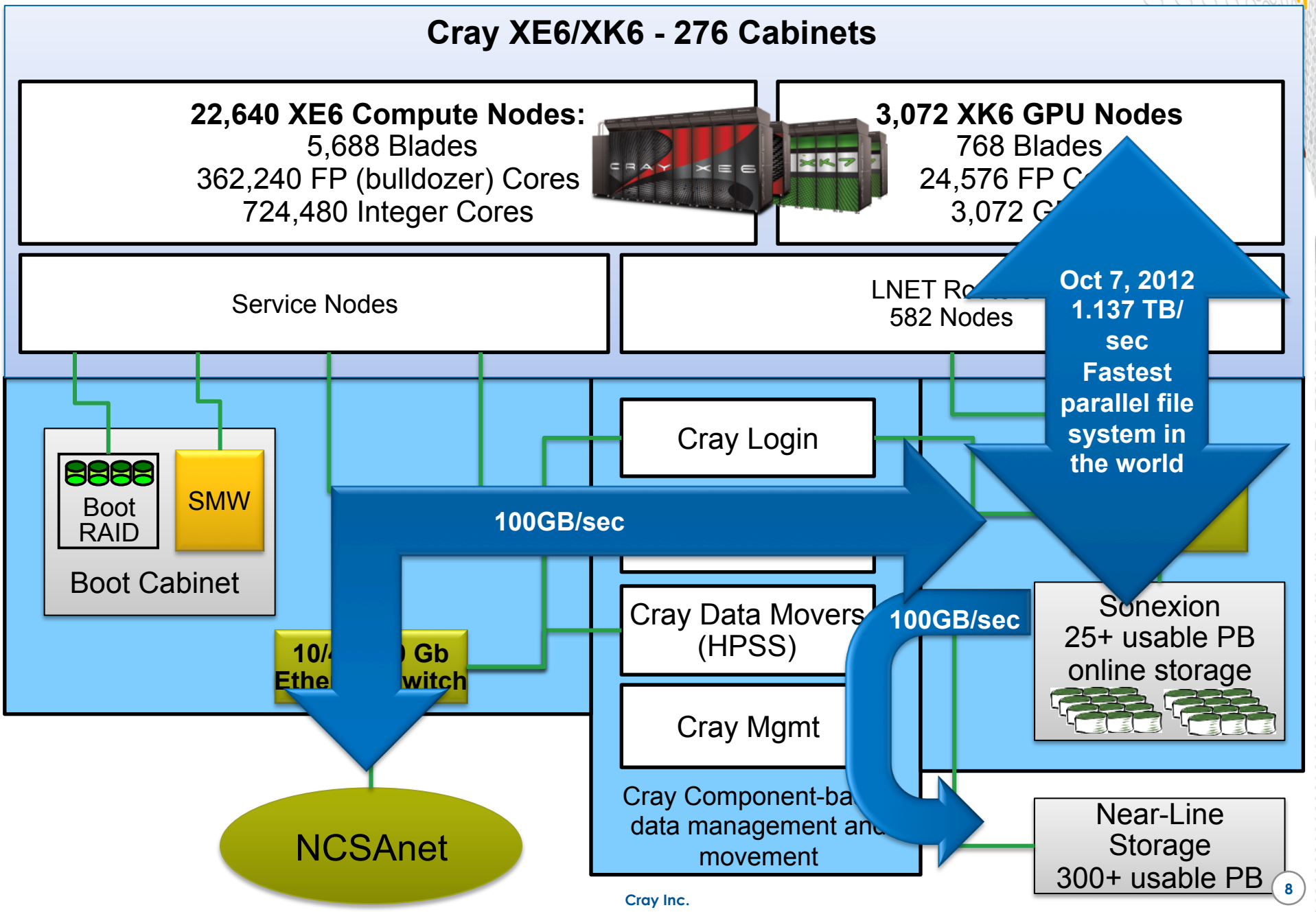
Inodes	IUsed	IFree	IUse%	Mounted on
1,469,743,104	101,043,696	1,368,699,408	7%	/mnt/a
1,469,743,104	12,751,040	1,456,992,064	1%	/mnt/b
2,549,448,704	519,930,884	2,029,517,820	21%	/mnt/c

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Integrated Storage at 1TB/sec
- 25+ PB of usable space
- Production Science at Full Scale
- Cray Reliability and Service

- 216 Drawers,432 OSSs, 864 OSTs
- Failover enabled
- 36 Top of Rack Switches
- Fine Grained Routing
- 632M files (4/16/2013)

Blue Waters Cray Solution



ACES

ACES, Advanced Computing at Extreme Scale, is a partnership of Sandia National Labs and Los Alamos National Lab. The Cielo computer is a 6136 processor Cray XE6 . File system capacities shown are before installation of Lustre.

Overview

Multidisciplinary research; national security, space exploration, renewable energy, nanotechnology, medicine, and supercomputing.

Challenge

Processor performance increases are outpacing storage bandwidth increases.

Solution

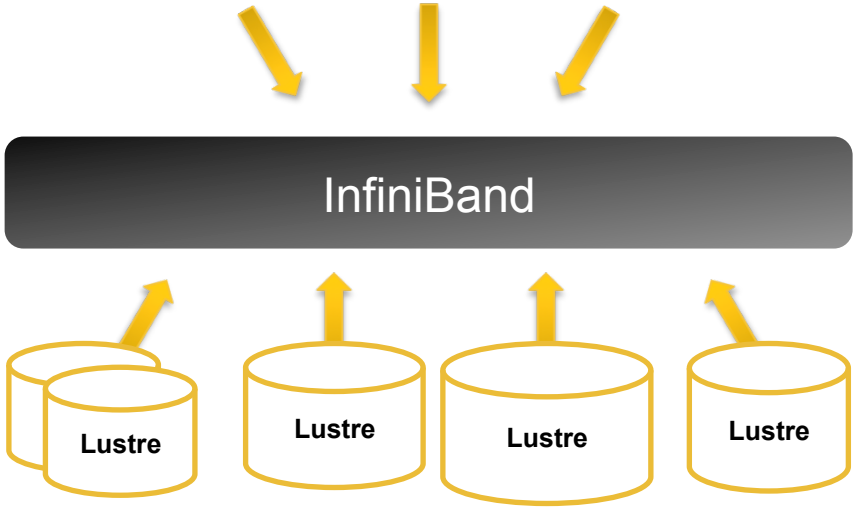
Cray Lustre File System software
NetApp 7900 storage arrays
- One 5 PB file system
- Two 2½ PB file systems
- Two small test file systems

Cray Management Services
Cray Development and Login Services

Success

Users are satisfied with bandwidth and reliability.

Total Capacity: 10 PBs
Bandwidth 160 GB/s



The future is seldom the same as the past

Seymour Cray
June 4, 1995