LLNL is home to some world's fastest computers!

Rank	Lab	Manuf.	Computer	Year
2	ORNL	Cray Inc.	Jaguar	20[illegible]
5	LBNL	Cray Inc.	Hopper	[illegible]
7	LANL	IBM	Roadrunner	[illegible]
10	LANL/SNL	Cray Inc.	Cielo	[illegible]
12	LLNL	IBM	Bl[illegible]	[illegible]
13	ANL	IBM	[illegible]	[illegible]
14	SNL	Oracle	[illegible]	[illegible]
16	LLNL	IBM[illegible]	[illegible]	[illegible]
30	ORNL	[illegible]	[illegible]	2008
31	SN[illegible]	[illegible]	[illegible]	2009
[illegible]	[illegible]	[illegible]	[illegible]	2010
[illegible]	[illegible]	[illegible]	[illegible]a	2010
[illegible]	[illegible]	[illegible]	Juno	2008
[illegible]	[illegible]	[illegible]	Cerrillos	2009
[illegible]	[illegible]	[illegible]	Muir	2010
[illegible]	[illegible]	Appro International	Hera	2009
[illegible]	[illegible]	Appro International	Edge	2010
[illegible]	PNNL	Hewlett-Packard	Chinook	2008
91	LLNL	Appro International	Graph	2009
92	BNL	IBM	New York Blue	2007
100	LLNL	IBM	ASC Purple	2006

and also some of the cheapest because we buy LSU in bulk

LSU = Linux Scalable Unit

Price Comparison

2010 pricing for 4GB/core cpu systems and RAID storage

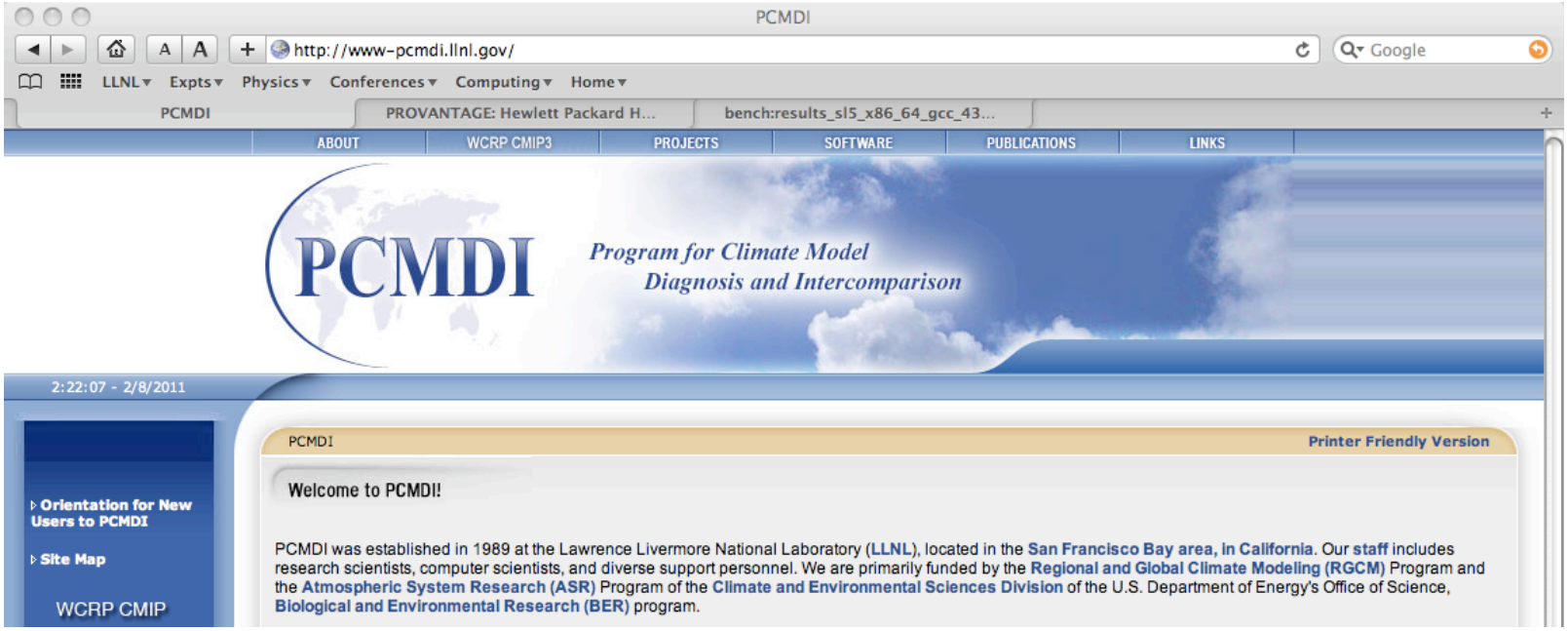
	$/SpecHep06	$/TB
ATLAS Premier Pricing	$ 27.8	$ 686
LLNL Standalone Quote	$ 32.3	$ 477
LLNL Quote from Sierra vendor	$ 23.6	*$230

- ATLAS pricing 25-50% discount below commodity costs
- LLNL obtains additional 15% discount for 72x12 cpu cluster linked to 1000-node Sierra procurement
- *Disk price includes LLNL contribution ~50%
- Current operations cost=0.25 FTE covers installation + admin

The Myth

- But isn't it easier to easier to gain access to Fort Knox than to LLNL computing?

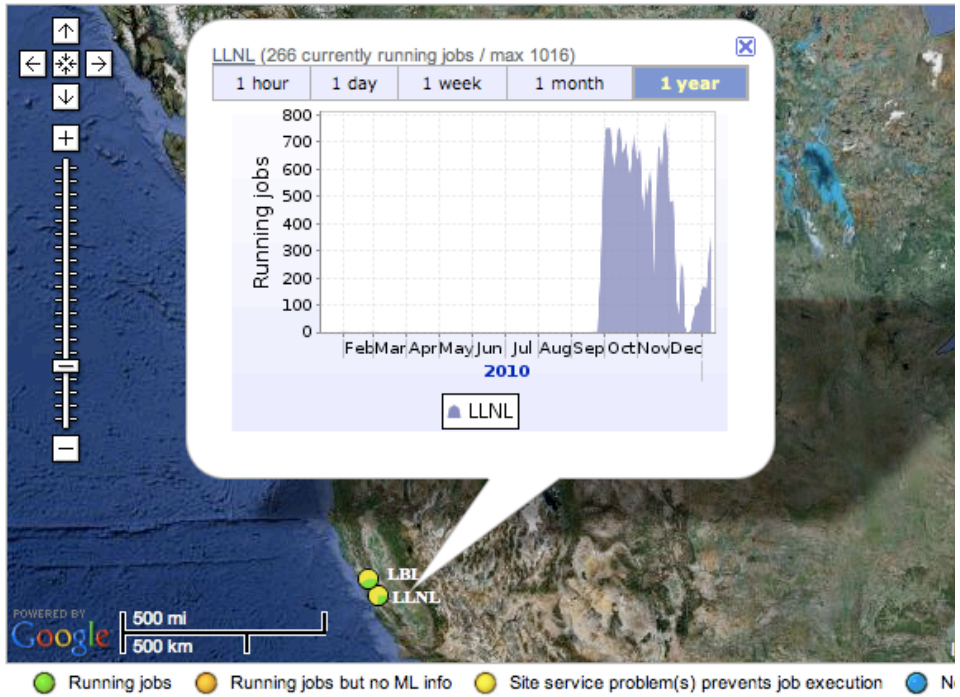
PCMDI - the first breakthrough



- 2006 – 700 TB Green Data Oasis purchased to serve PCMDI and external collaborations
- 2008 – permission to add cpu within GDO security plan
- 2010 – add 13.5 kHepSpec06 + 650 TB for ALICE/LHC

ALICE Computing at LLNL

- 13.6 kHepSpec06 + 650 TB
- $470k (~60% of cost elsewhere)
- Tier-2 Center, WLCG membership
- Achieving full OSG integration



- OP costs currently 0.25 FTE , approx. $75k/year
- Single architecture Linux Scalable Units reduce costs

LLNL Grid Computing Outlook

- ALICE Computing fully integrated with DOE-NP, USA collaborators and CERN
- Next ALICE procurement scheduled for 2013+
- Construction of Livermore Valley Open Campus will only improve climate for external computing at LLNL
- After Open Science Grid Integration is achieved, barrier to stage HEP computing is low
- Price competition from Livermore Computing may benefit DOE and also other labs