Top of Meeting

Some work to do for readiness and reporting
Update on NSF MRI Proposal

Rob Gardner • University of Chicago

US ATLAS Computing Integration and Operations Meeting
21 January 2015

Quarterly Reporting

- New requirements from management for tracking procurement and pledge capacity reporting
  - Will use Capacity Spreadsheet Google doc
  - See http://goo.gl/ahkGYF
- New requirement for Facility-level milestones linked to budgets
  - To be included here: http://goo.gl/RPneHN (password required)

Ending December 2014

Table 1: Installed capacities as of December 2014					Comparison to 2014 Pledge			
Center	Total CPU Installed (HS06)	Job slots installed (single logical threads)	Total Disk Installed (TB)	Local Group Disk allocated (TB)	Current Installed Beyond Pledge CPU HS06 (2014)	Current Beyond Pledge Job Slots (2014)	Current Beyond Pledge Disk TB (2014)	Current BPD-Local Group Disk TB (2014)
Tier1	126,381	12948	11000	294	44,381	4,547	3400	3106
AGLT2	62,134	6532	3726	253	45,134	4,745	1526	1273
MWT2	84,682	8992	3600	490	59,682	6,337	300	-190
NET2	43,391	4544	2300	223	26,391	2,764	100	-123
SWT2	40,906	4602	2930	21	23,906	2,689	730	709
WT2	42,486	3408	3424	260	25,486	2,044	1224	964
USATLAS FACILITY	399,980	41026	26,980	1541	224,980	23,127	7,280	5739
USATLAS TIER2	273,599	28078	15,980	1247	180,599	18,580	3,880	2633

Table 3: Budget activity as of December 2014

Center	FY14 equipment purchases ($)	Remaining FY14 funds ($)	CPU capacity increase with FY14 purchases	Job slots (single logical threads) increase with FY14 purchases	Storage capacity increase with FY14 purchases	Expected date for ATLAS production	FY15 budgeted labor + materials ($)	Remaining FY15 funds
Tier1								
AGLT2								
MWT2								
NET2								
SWT2								
WT2								
USATLAS FACILITY								
USATLAS TIER2								

Facility Run2 Readiness

- Have not been stressed in the last three months
  - Are we ready?
- Organized previously in http://goo.gl/S8TcZx
- Review & redefine metrics and exercises
  - Network
  - Disk-to-disk throughput
  - Deletion rate
  - Wide area enabled
  - More…

LHC AnalyNet: NSF-funded LHC sites

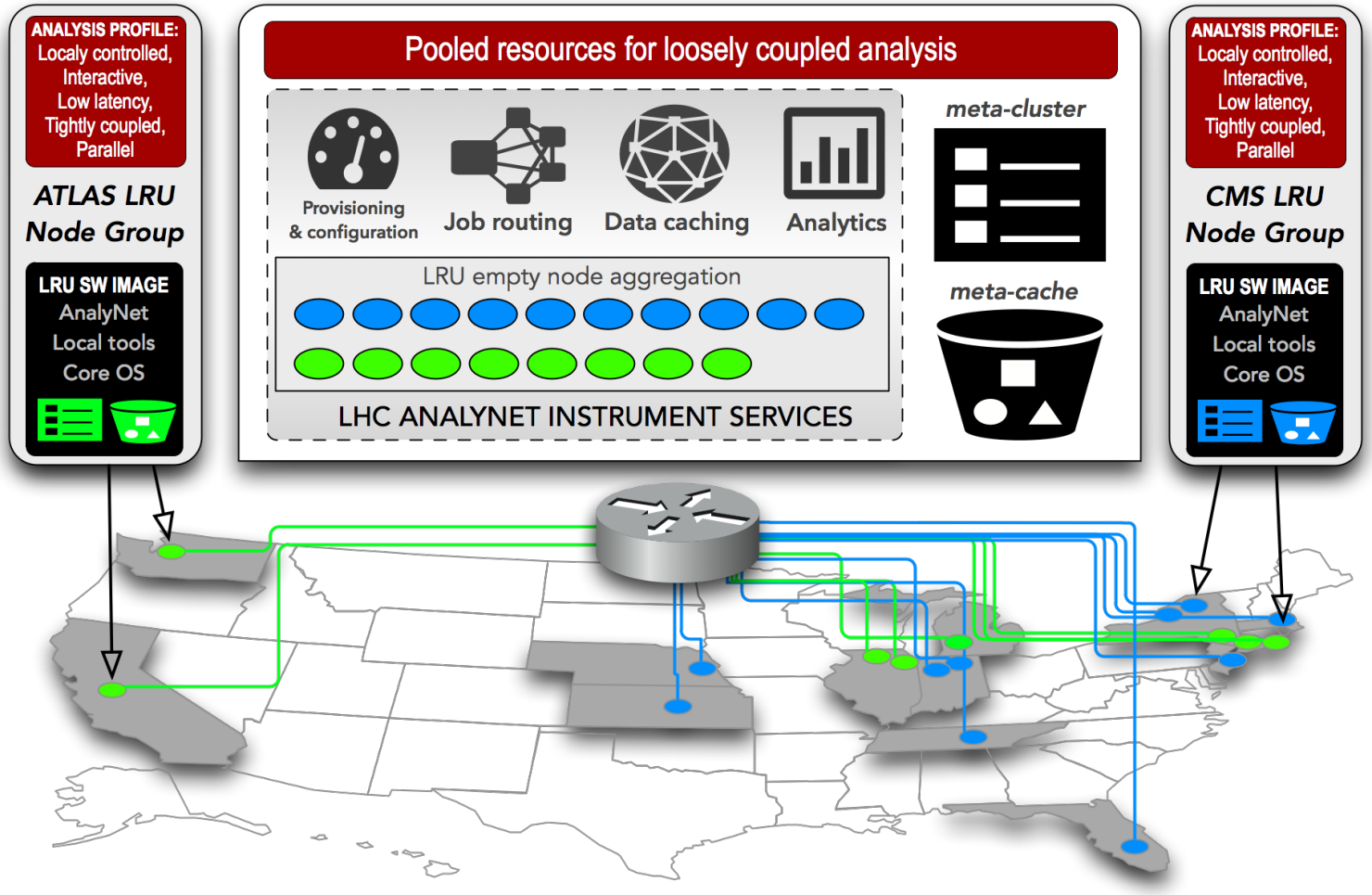
University of Chicago, Columbia University, New York University, Fresno State University, Michigan State University, Northern Illinois University, Stony Brook University, University of Washington, State University of New York-Buffalo, Cornell University, Florida International University, University of Kansas, University of Nebraska-Lincoln, Northeastern University, University of Notre Dame, Purdue University-Calumet, Rutgers University, Vanderbilt University, ***operated as a federated cyberinfrastructure***

MRI LHC AnalyNet - Essentials

- 18 NFS-funded universities in the US LHC program
  - 8 ATLAS, 10 CMS
  - $960k total ($150k Fresno overhead, $140 FTE, rest is equipment)
    - 30% of this is from university cost share
- MRI rules require a “development” proposal
  - “**single, well-integrated instrument**”
  - Advanced Cyberinfrastructure (ACI) design led by Chicago and UCSD

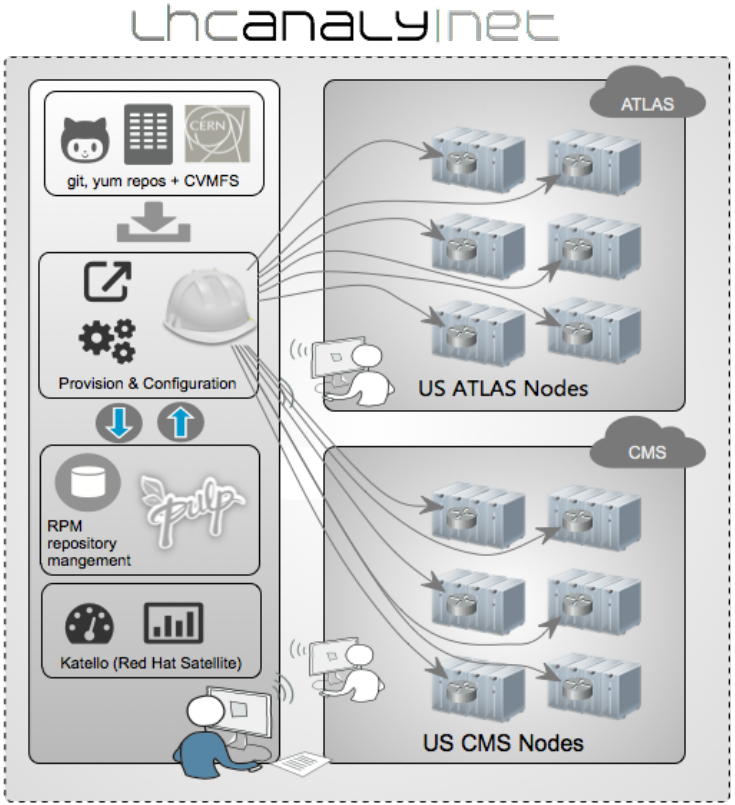
Proposal will include development

- 0.5 FTE-year at Chicago and Notre Dame
- Two significant work areas:
  - Multi-site provisioning and configuration management
  - Job routing and Xrootd caching network
- Both heavily leverage external efforts
  - Provisioning: DevOps at Chicago and Notre Dame
  - Caching: AAA(UCSD)/FAX(UC) and HTCondor(UW)/CI Connect(UC)


ANALYSIS PROFILE:
Localy controlled,
Interactive,
Low latency,
Tightly coupled,
Parallel
ATLAS LRU
Node Group
LRU SW IMAGE
AnalyNet
Local tools
Core OS
Pooled resources for loosely coupled analysis
Provisioning
& configuration
Job routing
Data caching
Analytics
LRU empty node aggregation
LHC ANALYNET INSTRUMENT SERVICES
meta-cluster
meta-cache
ANALYSIS PROFILE:
Localy controlled,
Interactive,
Low latency,
Tightly coupled,
Parallel
CMS LRU
Node Group
LRU SW IMAGE
AnalyNet
Local tools
Core OS

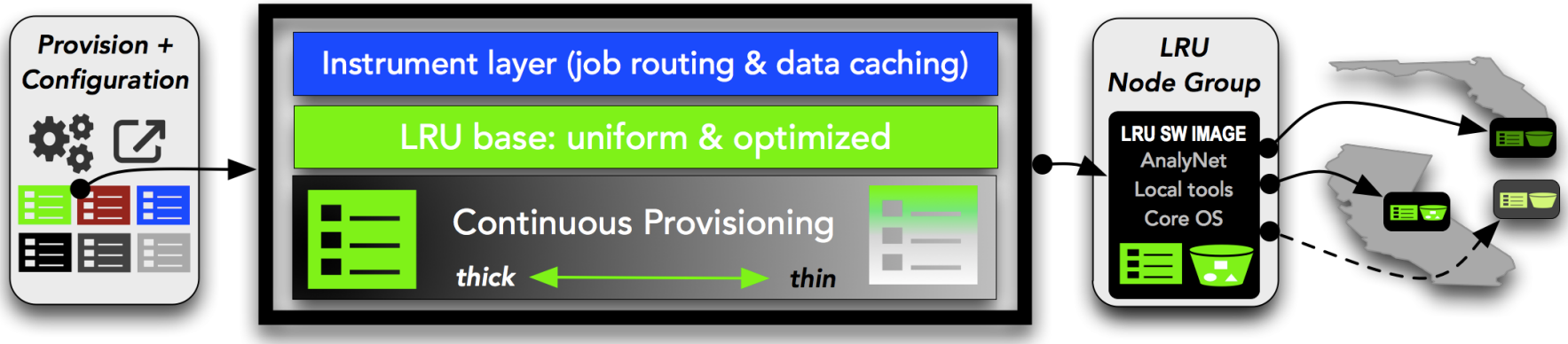
Provisioning and configuration mgt

- Multiple sites organized as a single data center
- Modern, open source tools
- Spectrum of thin-to-thick provisioning
  - Increase uniformity, rapid updates
  - Reduce site effort
  - Provide central analytics, benchmarks



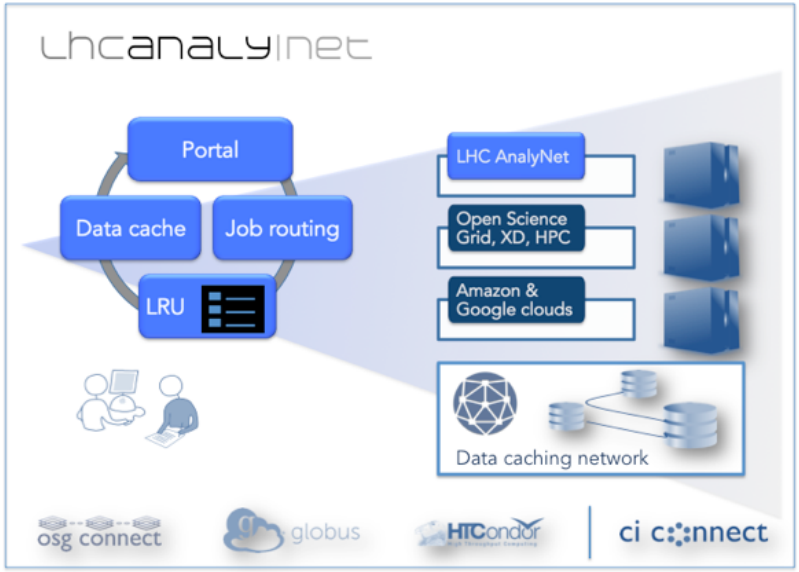
Thick-to-Thin Provisioning

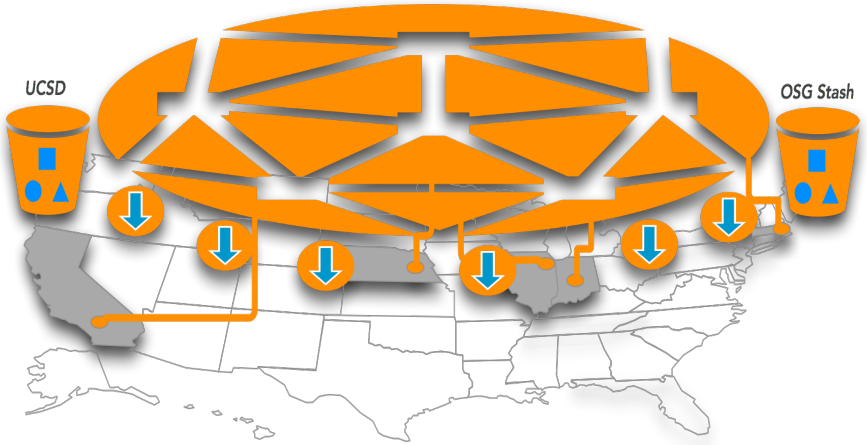
Uunique approach extends industry standard data center management tools to the wide area network allowing a small team of experts to implement instrument-wide services without introducing significant burdens on site administrators while accruing the benefits of service automation and software uniformity



Instrument Components

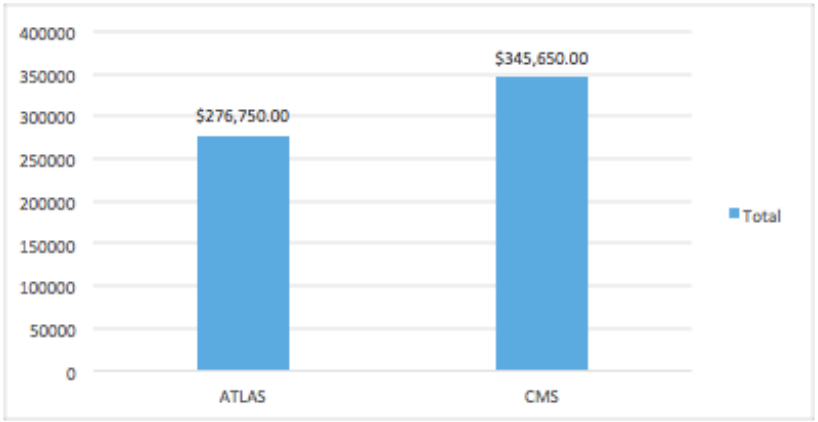
Cycle sharing and data caching network - leverage CMS AAA and OSG StashCache ➔ ATLAS FAX Cache





Equipment for US ATLAS Institutions

Institute	Experimer	LRU	Disk (TB)2	Ideal Cost	NSF Share	University Cost Share	Fresno Overhead	Total
Chicago	ATLAS	2	80	$ 44,800.00	$ 31,360.00	$ 13,440.00	$ 10,000.00	$ 54,800.00
MSU	ATLAS	2	60	$ 43,100.00	$ 30,170.00	$ 12,930.00	$ 10,000.00	$ 53,100.00
Stony Brook	ATLAS	2	55	$ 42,675.00	$ 29,872.50	$ 12,802.50	$ 10,000.00	$ 52,675.00
UW	ATLAS	2	45	$ 41,825.00	$ 29,277.50	$ 12,547.50	$ 10,000.00	$ 51,825.00
NYU	ATLAS	2	40	$ 41,400.00	$ 28,980.00	$ 12,420.00	$ 10,000.00	$ 51,400.00
Columbia	ATLAS	1	30	$ 21,550.00	$ 15,085.00	$ 6,465.00	$ 6,034.00	$ 27,584.00
NIU	ATLAS	1	30	$ 21,550.00	$ 15,085.00	$ 6,465.00	$ 6,034.00	$ 27,584.00
Fresno	ATLAS	1	10	$ 19,850.00	$ 19,850.00	$ -	$ -	$ 19,850.00



Aggregate LHC AnalyNet capacity

LRU (ATLAS+CMS)	29
Logical cores	3712
Storage TB (raw)	845

Potential expansion to DOE sites

If successful, LHC AnalyNet will be the default analysis platform for the 96 US LHC institutes