

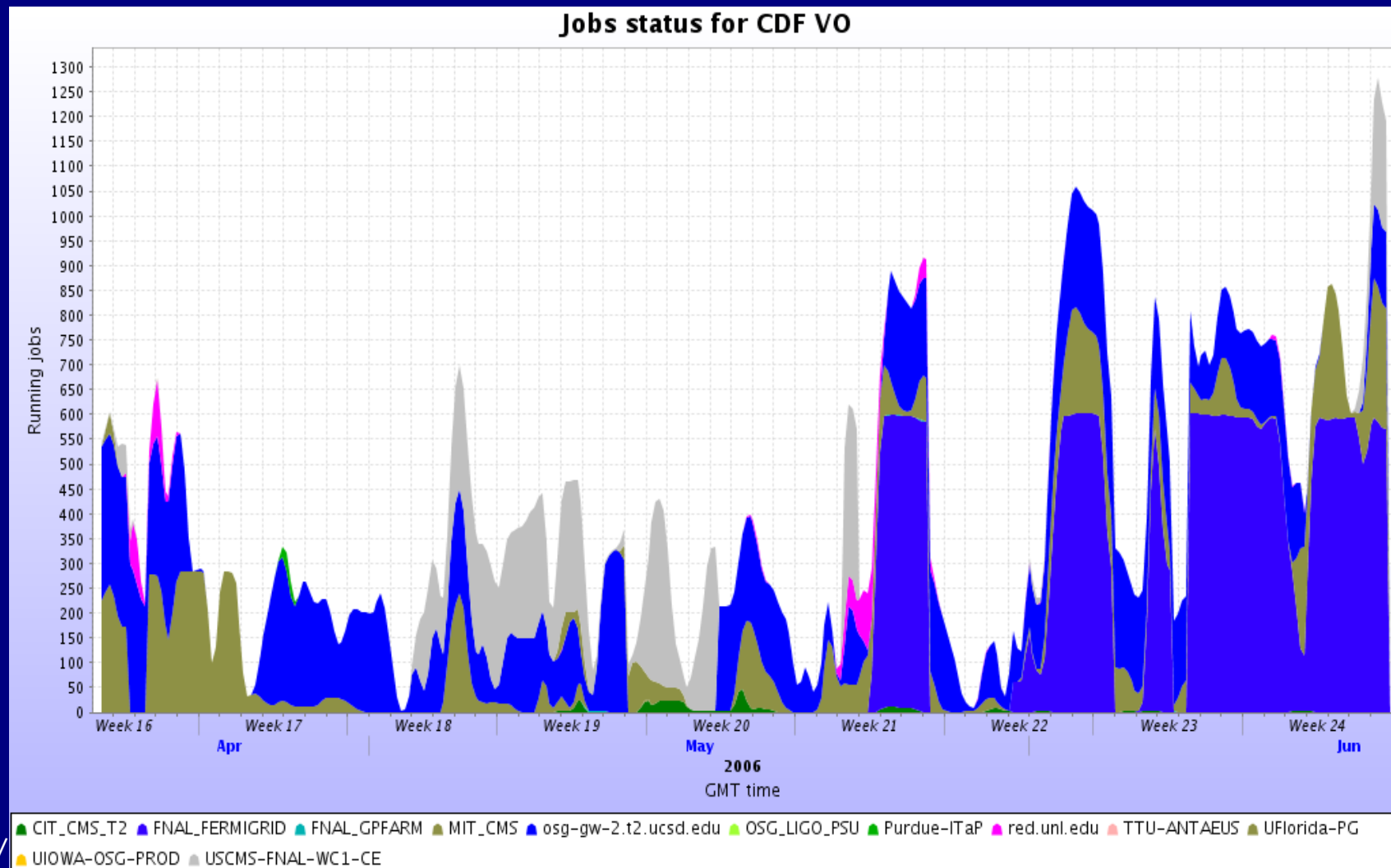
Non-LHC VOs on OSG



- LIGO will bring new analyses to OSG in 3-6 months. Need local SEs at each site.
- D0 making use of a few sites. Once the generic Resource Selection is deployed in the summer will use more cycles.
- CDF making steady use of OSG for Monte Carlo using Glide-in/Pilot jobs - site configuration inconsistencies and people to get things to work!

Non-LHC VOs on OSG

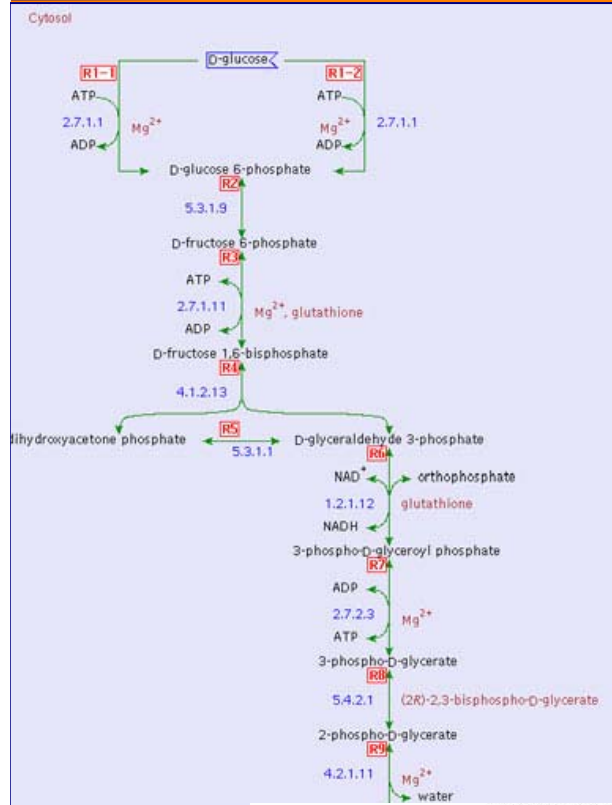
- CDF used 12 sites within last 2 months



Applications with Cyclic Loads



- Genome Analysis & Database Update (GADU).
- 1000 CPUs for one week every 1-2 months



06/19/06

Bioinformatics Group
MCS, Argonne

PUMA2 -- Evolutionary Analysis of Metabolism

Home Search Metabolic Reconstructions Phenotype Protein Families About

NCBI GeneID: 1977249 - dna gyrase, a subunit [Bacillus subtilis str. 'Ames Ancestor']

NCBI Entrez protein: Q0253522; 30260201, 42735002, 42779087, 47500408, 49176972, 49183045, 49328243, 49476687, 65317474

TrEMBL: Q81W30_BACAN DNA gyrase, A subunit

PIR-NREF: NP01005958

NCBI Accession: YP_0156609.1

locus tag: OBAA0006

Gene name: gyrA

Source Organism: Bacillus anthracis str. 'Ames Ancestor'

Tax ID: 261594

PIR Superfamily: SF001512 Type II topoisomerase, subunit A
SF500085 DNA gyrase, subunit A

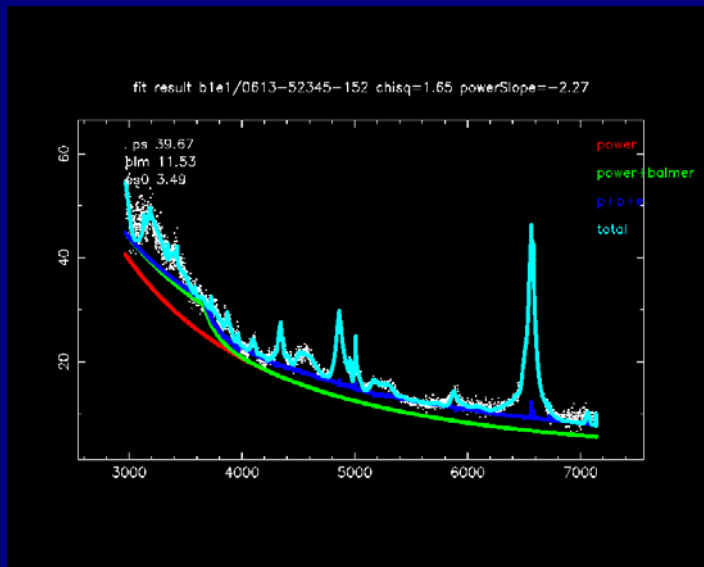
Protein sequence statistics

| Chromosomal Organization | Sequence length (823 aa) | Annotations |
|--------------------------|---|--|
| STRING | < 1 e ⁻¹⁰⁰ | INTERPRO |
| The SEED | | IPR002205 DNA gyrase/topoisomerase IV, subunit A |
| Stability - Clustal | | IPR005743 DNA gyrase, subunit A |
| BLAST vs. nr | | IPR006691 DNA gyrase C-terminal repeat, beta-propeller |
| Fasta3 vs. UniProt | | No BLOCKS hits = no data available |
| Blocks-Blast | | BLAST vs. nr |
| PhyloBlast | | |
| BLink | | |
| Orthologs | 10172619 DNA gyrase subunit A [Bacillus halodurans C-125] | |
| Paralogs | 1346238 GYRA_STAAU DNA gyrase subunit A | |
| | 13699923 DNA gyrase subunit A [Staphylococcus aureus subsp. aureus] | |
| | 15022824 DNA gyrase (topoisomerase II) A subunit [Clostridium acetobutylicum] | |
| | 1520086 DNA gyrase A subunit | |
| | 15458723 DNA gyrase subunit A [Streptococcus pneumoniae R6] | |
| InterPro | 15673093 DNA gyrase subunit A [Lactococcus lactis subsp. lactis I1140] | |
| Blocks | 15922996 DNA gyrase subunit A [Staphylococcus aureus subsp. aureus] | |
| CDART | 16077075 DNA gyrase (subunit A) [Bacillus subtilis subsp. subtilis str. 168] | |

Astrophysics

- Data Intensive Image Merging (Coadd)
- Simulations for Dark Energy Survey towards fall Data Challenge 1.
- Quasar fitting algorithm exploration.

Need >200G data areas on local sites.



06/19/06

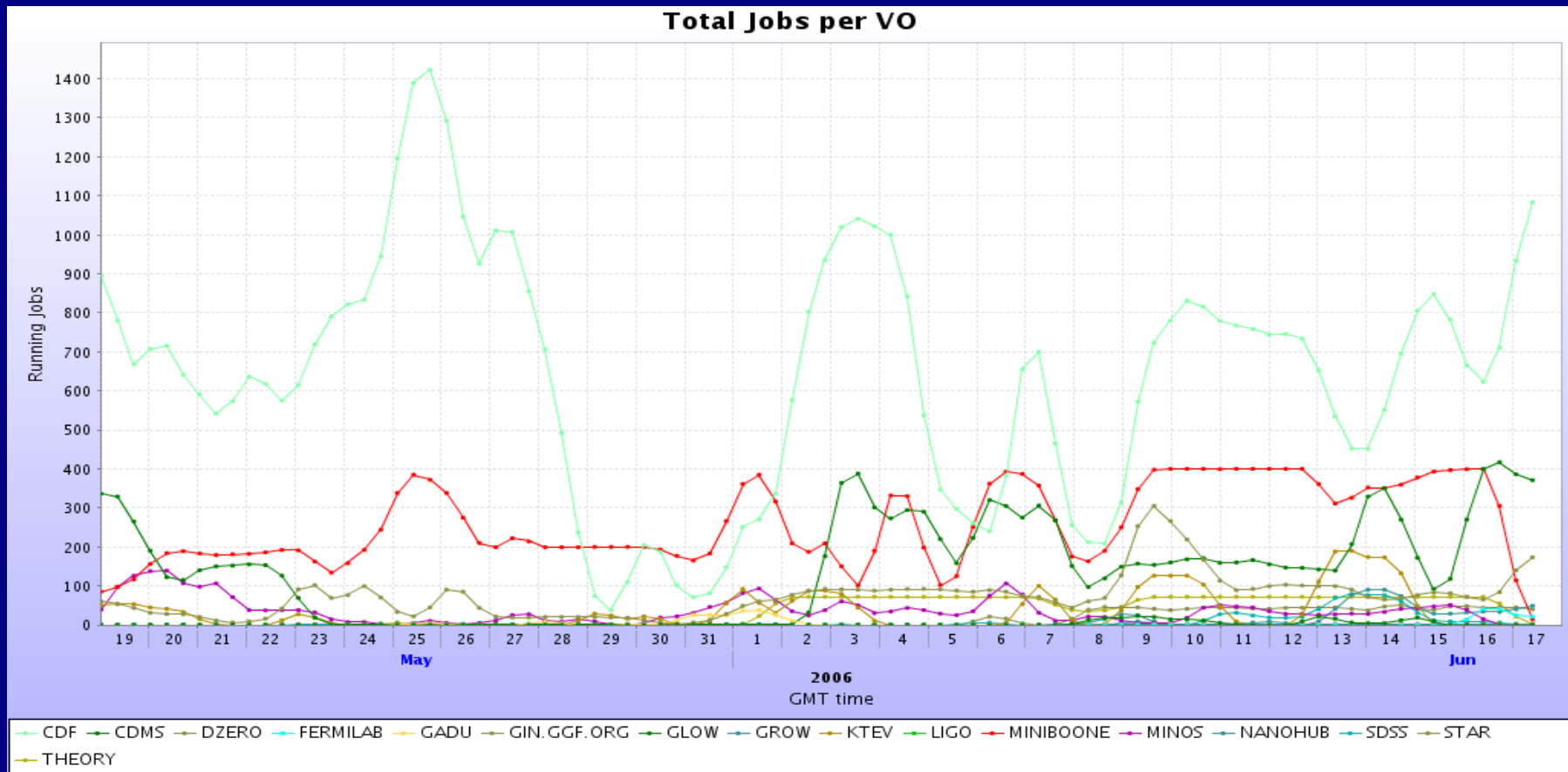


DARK ENERGY
SURVEY

Non-LHC VO Use..



16 non-LHC VOs using few to more than 1000 CPUs at a time



CS Explorations

- Investigation of “Football-Pool problem” at new scales “determine how many lottery tickets one would have to buy to guarantee that no more than one prediction is incorrect. only fairly weak bounds are known on this value. Solutions have application in data compression, coding theory and statistical design.”

Code Design
Building Your Grid
Solving the Football Pool Problem

Background
Dealing with Symmetry
Using MW

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Application — Code Design



- $W(v, \alpha)$: Set of all “words” of length v from alphabet $\{0, 1, \dots, \alpha - 1\}$.
- $|W(v, \alpha)| = \alpha^v$
- We will abbreviate $W(v, \alpha) = W$
- A **code** is a subset $C \subseteq W$
- **Hamming distance**: $a \in W, b \in W$, $\text{dist}(a, b) = |\{i \mid a_i \neq b_i\}|$

Code Applications

Error Correcting Code

- Find $C \subseteq W$ such that $a \in C, b \in C \Rightarrow \text{dist}(a, b) \geq 2d + 1$
- Maximize $|C|$
- **Application**: Words in C submit over a “noisy” channel on which at most d letters are changed can be “self-corrected.”

Covering Code

- Find a code $C \subseteq W$ such that every word $w \in W$ is at most a distance d away from at least one word in C
- $(\text{dist}(w, C) \leq d \forall w \in W)$
- Minimize $|C|$
- **Application**: Something far more practical



Some other applications arriving:



- Nanotechnology and Geographic Information Systems coming to the table.