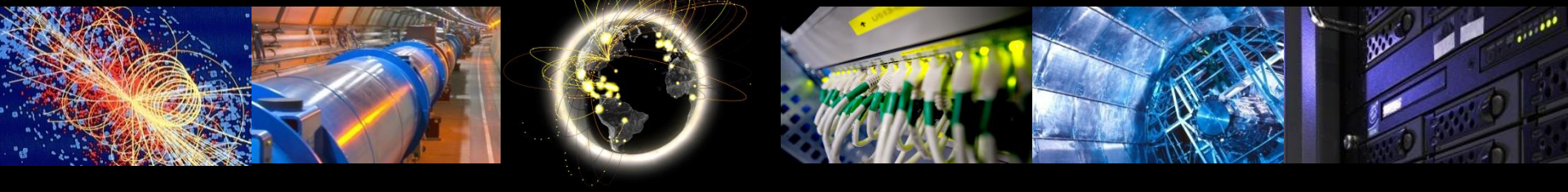
Accounting Update

John Gordon and Stuart Pullinger

January 2014 GDB



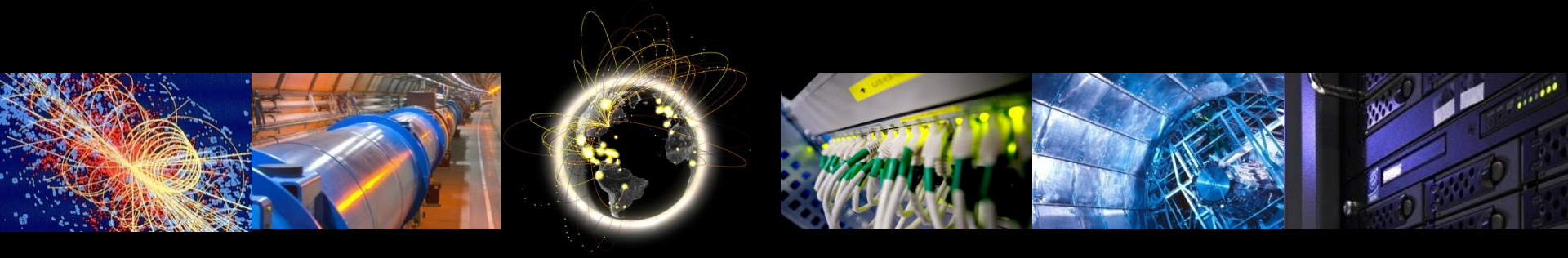
WLCG
Worldwide LHC Computing Grid

Accounting

- CPU Usage Accounting
- Storage Accounting
- Cloud Accounting

CPU Accounting

Stuart Pullinger, STFC



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Outline

- Support Dates
- EMI3 client features
- Migrating from EMI2 to EMI3
- Other clients
- The last year
- The next year




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Support Dates

- EMI2
  - 2013-10-31
    - End of Standard Support
  - 2014-04-30
    - End of Security Updates
- EMI3
  - Continues
  - http://www.eu-emi.eu/retirement-calendar

EMI3 Client Features

- Supports HEPSPEC06
- Richer data collected
  - MPI
    - Number of Nodes
    - Number of Processors
  - Summaries by submithost
- Portal support later this year

EMI2 to EMI3 Migration

- Complete rewrite of client in Python
  - EMI2 client was Java
  - New database schema
  - Requires more than just package upgrades
- Month boundary issue
- Upgrade instructions
- Email us

Other Clients

- Use our SSM2 messaging library (Python)
- SGAS (NorduGrid)
- ARC + JURA
- QCG
- EDGI Desktop Grid

- CERN, DGAS, NIKHEF, and OSG use an earlier version and should upgrade

Last Year

- Enforced the Data Retention Policy
- Only keep UserDN job records for 18 months
- After that job records are deleted and we only have the various summaries

The Next Year

- EGI-Inspire ends April 2014
- Core Services continuing
  - Includes Accounting
  - Bugfixes only
- Development continues for Cloud and Storage Accounting

Questions




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References

- Upgrade Instructions

  https://twiki.cern.ch/twiki/pub/EMI/EMI3APELClient/APEL_Client_Upgrade_Plan.pdf

- APEL Documentation

  https://twiki.cern.ch/twiki/bin/view/EMI/EMI3APELClient

- Latest packages

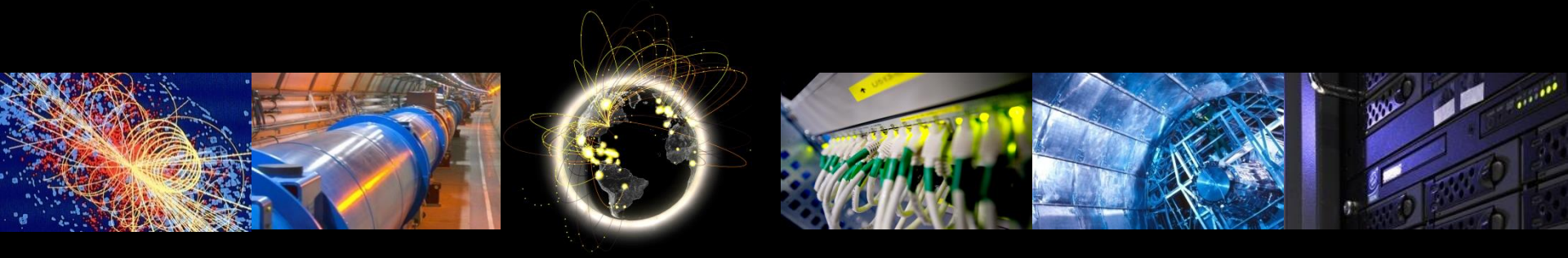
  http://apel.github.io/apel/

- Development

  https://github.com/apel/

Storage Accounting

John Gordon, STFC



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Status

- DPM and dCache released StAR publishers in EMI3.
- DPM 1.8.7 or later
- dCache 2.5.2 or later – Golden release 2.6
- Italy has cut StAR records from BDII
- All use SSM to publish to APEL at RAL.
  - Same method as used for CPU by EMI3 APEL, CERN, DGAS, SGAS, ARC/JURA

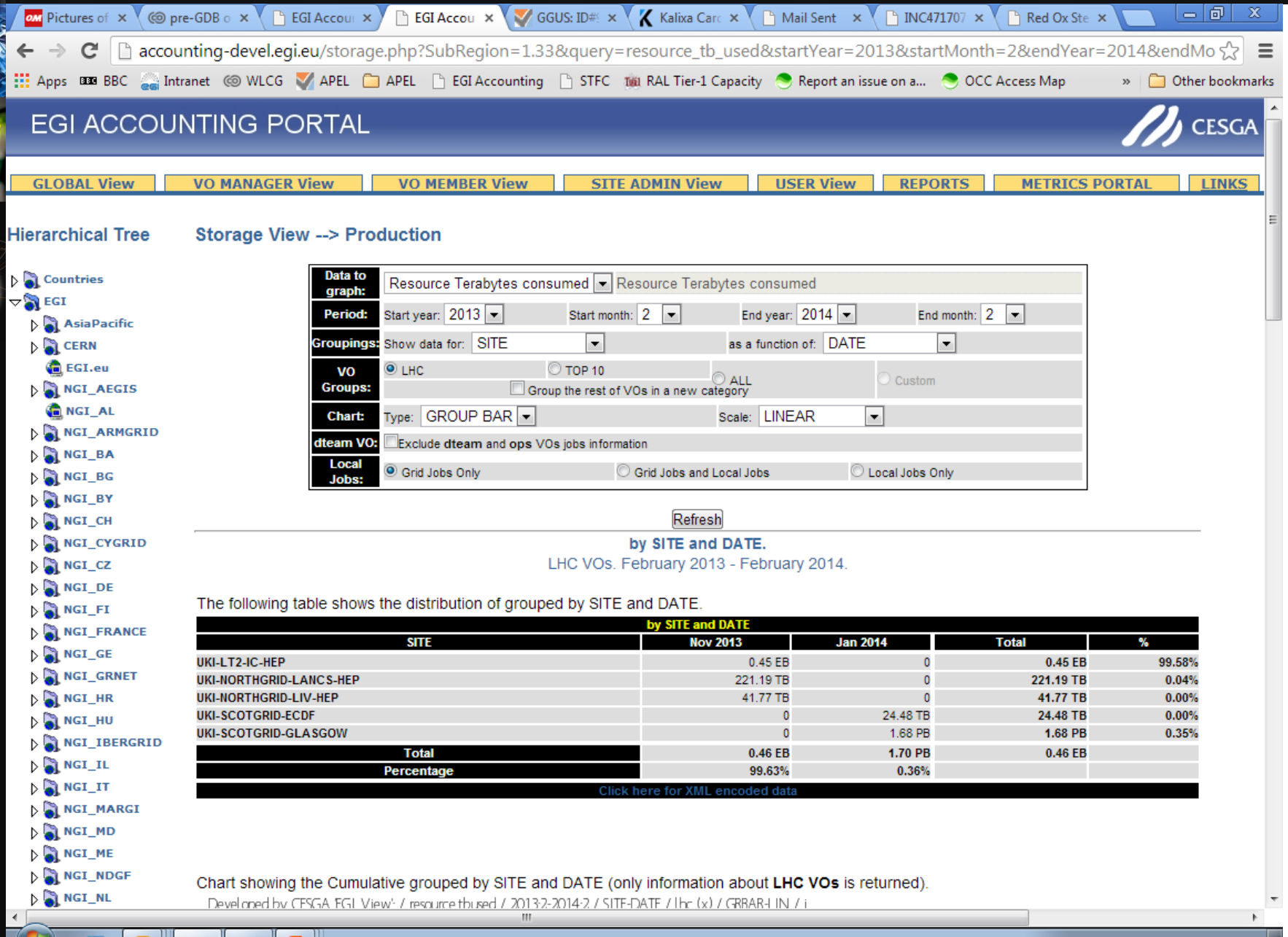
Storage Status

- in November we approached a few production sites to try publishing in DPM and dcache to the test broker.
  - This was successful, ironed out some bugs and developed the documentation. We received data from 3.
- Last week I approached a few more and there are already a couple more publishing and others planning..
- More detailed perusal of the data reveals a few flaws in the logic though so I will be going back to the developers.
  - e.g. Time period of the UR.

Portal

- The portal has implemented a similar view to CPU with the same selection of options, dates, hierarchy tree.
- It displays
  - ResourceCapacityAllocated
  - ResourceCapacityUsed
  - LogicalCapacityUsed
  - Nfiles

Portal Date View



accounting-devel.egi.eu/storage.php?SubRegion=1.33&query=resource_tb_used&startYear=2013&startMonth=2&endYear=2014&endMo

Apps BBC Intranet WLCG APEL APEL EGI Accounting STFC RAL Tier-1 Capacity Report an issue on a... OCC Access Map Other bookmarks

EGI ACCOUNTING PORTAL

CESGA

GLOBAL View | VO MANAGER View | VO MEMBER View | SITE ADMIN View | USER View | REPORTS | METRICS PORTAL | LINKS

Hierarchical Tree

- Countries
- EGI
  - AsiaPacific
  - CERN
  - EGI.eu
  - NGI_AEGIS
  - NGI_AL
  - NGI_ARMGRID
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  - NGI_CZ
  - NGI_DE
  - NGI_FI
  - NGI_FRANCE
  - NGI_GE
  - NGI_GRNET
  - NGI_HR
  - NGI_HU
  - NGI_IBERGRID
  - NGI_IL
  - NGI_IT
  - NGI_MARGI
  - NGI_MD
  - NGI_ME
  - NGI_NDGF
  - NGI_NL

Storage View --> Production

Data to graph:	Resource Terabytes consumed (Resource Terabytes consumed)
Period:	Start year: 2013 Start month: 2 End year: 2014 End month: 2
Groupings:	Show data for: SITE as a function of: DATE
VO Groups:	LHC / TOP 10 / ALL / Custom; Group the rest of VOs in a new category
Chart:	Type: GROUP BAR Scale: LINEAR
dteam VO:	Exclude **dteam** and **ops** VOs jobs information
Local Jobs:	Grid Jobs Only / Grid Jobs and Local Jobs / Local Jobs Only

Refresh

by SITE and DATE.

LHC VOs. February 2013 - February 2014.

The following table shows the distribution of grouped by SITE and DATE.

by SITE and DATE				
SITE	Nov 2013	Jan 2014	Total	%
UKI-LT2-IC-HEP	0.45 EB	0	0.45 EB	99.58%
UKI-NORTHGRID-LANCS-HEP	221.19 TB	0	221.19 TB	0.04%
UKI-NORTHGRID-LIV-HEP	41.77 TB	0	41.77 TB	0.00%
UKI-SCOTGRID-ECDF	0	24.48 TB	24.48 TB	0.00%
UKI-SCOTGRID-GLASGOW	0	1.68 PB	1.68 PB	0.35%
Total	0.46 EB	1.70 PB	0.46 EB	
Percentage	99.63%	0.36%		

Click here for XML encoded data

Chart showing the Cumulative grouped by SITE and DATE (only information about **LHC VOs** is returned).

Developed by CESGA EGI View: / resource tbused / 2013-2-2014-2 / SITE-DATE / lhc (x) / GRBAR-LIN / i

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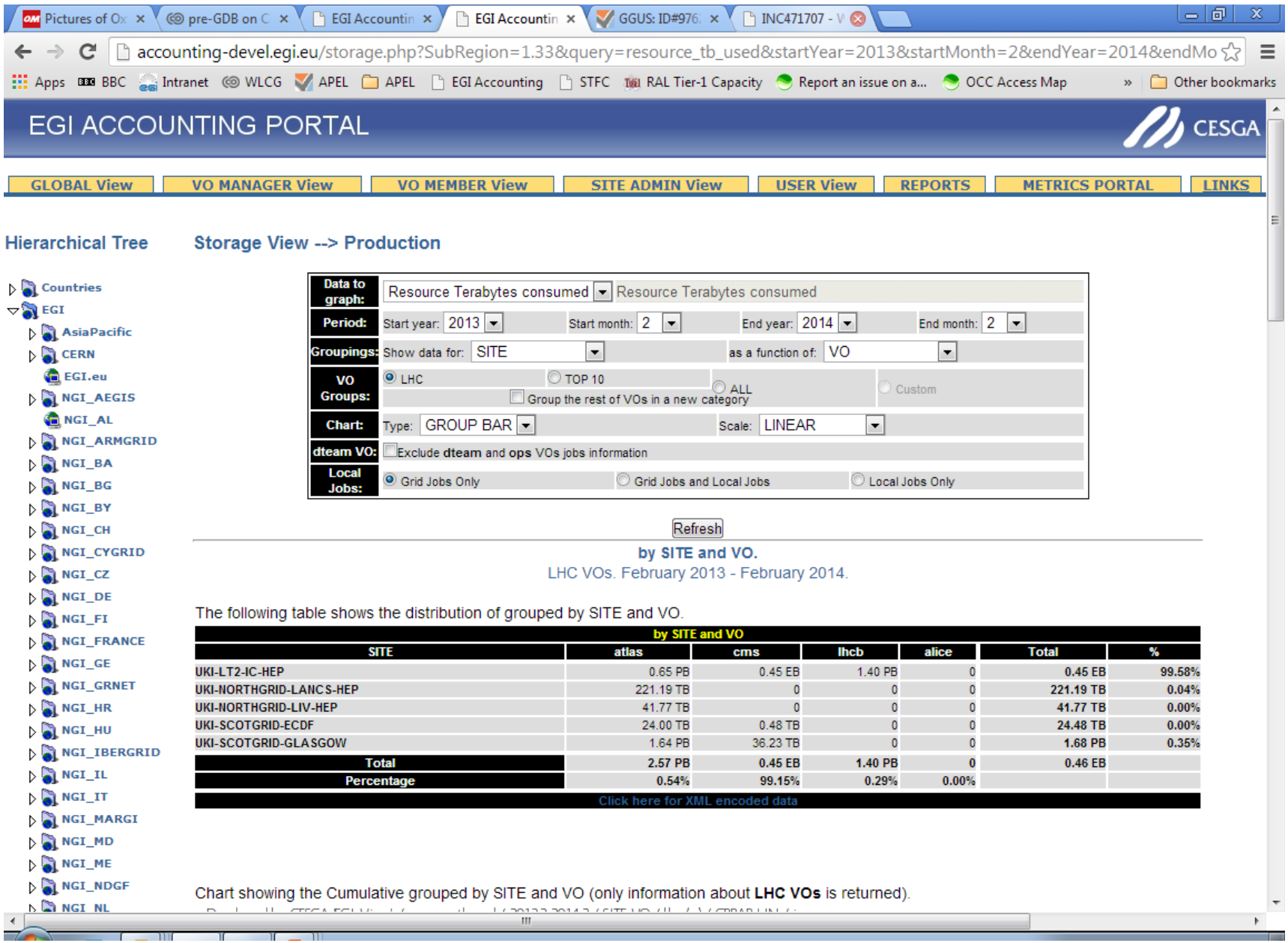
Portal VO View



Pictures of Ox | pre-GDB on C | EGI Accountin | EGI Accountin | GGUS: ID#976 | INC471707 - V

accounting-devel.egi.eu/storage.php?SubRegion=1.33&query=resource_tb_used&startYear=2013&startMonth=2&endYear=2014&endMo

Apps | BBC | Intranet | WLCG | APEL | APEL | EGI Accounting | STFC | RAL Tier-1 Capacity | Report an issue on a... | OCC Access Map | Other bookmarks

EGI ACCOUNTING PORTAL — CESGA

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VO Groups:	LHC / TOP 10 / ALL / Custom; Group the rest of VOs in a new category
Chart:	Type: GROUP BAR — Scale: LINEAR
dteam VO:	Exclude **dteam** and **ops** VOs jobs information
Local Jobs:	Grid Jobs Only / Grid Jobs and Local Jobs / Local Jobs Only

Refresh

by SITE and VO.

LHC VOs. February 2013 - February 2014.

The following table shows the distribution of grouped by SITE and VO.

by SITE and VO						
SITE	atlas	cms	lhcb	alice	Total	%
UKI-LT2-IC-HEP	0.65 PB	0.45 EB	1.40 PB	0	0.45 EB	99.58%
UKI-NORTHGRID-LANCS-HEP	221.19 TB	0	0	0	221.19 TB	0.04%
UKI-NORTHGRID-LIV-HEP	41.77 TB	0	0	0	41.77 TB	0.00%
UKI-SCOTGRID-ECDF	24.00 TB	0.48 TB	0	0	24.48 TB	0.00%
UKI-SCOTGRID-GLASGOW	1.64 PB	36.23 TB	0	0	1.68 PB	0.35%
Total	2.57 PB	0.45 EB	1.40 PB	0	0.46 EB	
Percentage	0.54%	99.15%	0.29%	0.00%		

Click here for XML encoded data

Chart showing the Cumulative grouped by SITE and VO (only information about **LHC VOs** is returned).

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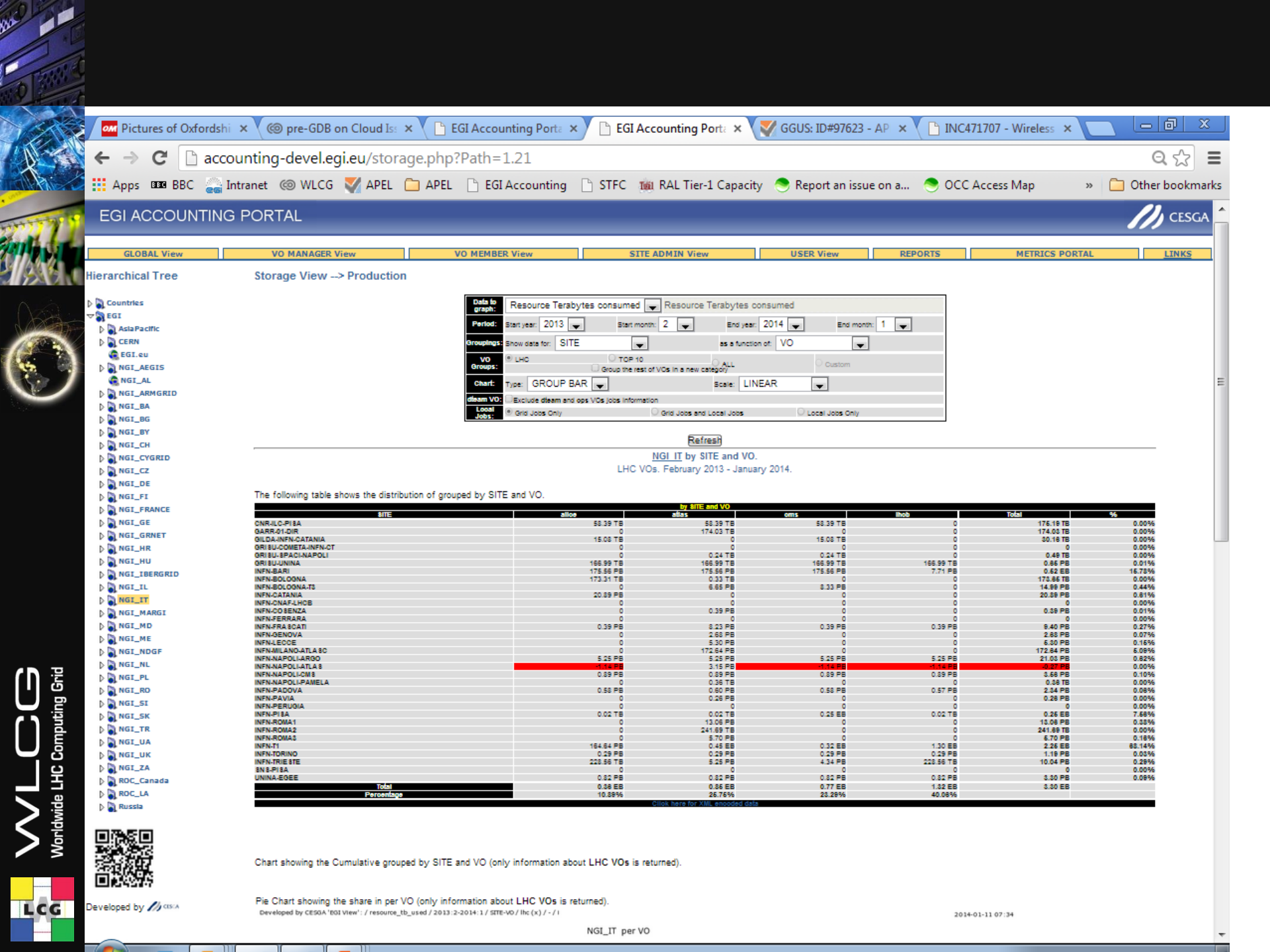
Italian View

- The Italian NGI implemented a service which queries the BDII and cuts StAR records.
- They have implemented this for all Italian Sites
- Still need to verify data
- Plan to use this to produce storage data for sites which don't run support storage systems.
- Probably less accurate but very much better than nothing.


Pictures of Oxfordshi
pre-GDB on Cloud Is
EGI Accounting Porta
EGI Accounting Porta
GGUS: ID#97623 - AP
INC471707 - Wireless
accounting-devel.egi.eu/storage.php?Path=1.21
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APEL
APEL
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NGI_HR
NGI_HU
NGI_IBERGRID
NGI_IL
NGI_IT
NGI_MARGI
NGI_MD
NGI_ME
NGI_NDGF
NGI_NL
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ROC_Canada
ROC_LA
Russia
Data to graph:
Resource Terabytes consumed
Resource Terabytes consumed
Period:
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Groupings:
Show data for: SITE
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VO Groups:
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Group the rest of VOs in a new category
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Refresh
NGI_IT by SITE and VO.
LHC VOs. February 2013 - January 2014.
The following table shows the distribution of grouped by SITE and VO.
by SITE and VO
SITE
alice
atlas
cms
lhcb
Total
%
CNR-ILC-PISA 58.39 TB 58.39 TB 58.39 TB 0 175.19 TB 0.00%
GARR-01-DIR 0 174.03 TB 0 0 174.03 TB 0.00%
GILDA-INFN-CATANIA 15.08 TB 0 15.08 TB 0 30.16 TB 0.00%
GRISU-COMETA-INFN-CT 0 0 0 0 0 0.00%
GRISU-SPACI-NAPOLI 0 0.24 TB 0.24 TB 0 0.48 TB 0.00%
GRISU-UNINA 166.99 TB 166.99 TB 166.99 TB 166.99 TB 0.86 PB 0.01%
INFN-BARI 175.56 PB 175.56 PB 175.56 PB 7.71 PB 0.62 EB 16.78%
INFN-BOLOGNA 173.31 TB 0.33 TB 0 0 173.65 TB 0.00%
INFN-BOLOGNA-T3 0 6.65 PB 8.33 PB 0 14.98 PB 0.44%
INFN-CATANIA 20.89 PB 0 0 0 20.89 PB 0.61%
INFN-CNAF-LHCB 0 0 0 0 0 0.00%
INFN-COSENZA 0 0.39 PB 0 0 0.39 PB 0.01%
INFN-FERRARA 0 0 0 0 0 0.00%
INFN-FRASCATI 0.39 PB 8.23 PB 0.39 PB 0.39 PB 9.40 PB 0.27%
INFN-GENOVA 0 2.68 PB 0 0 2.68 PB 0.07%
INFN-LECCE 0 5.30 PB 0 0 5.30 PB 0.15%
INFN-MILANO-ATLAS 0 172.64 PB 0 0 172.64 PB 5.09%
INFN-NAPOLI-ARGO 5.25 PB 5.25 PB 5.25 PB 5.25 PB 21.00 PB 0.62%
INFN-NAPOLI-ATLAS 114 PB 3.15 PB 114 PB 114 PB 345 PB 0.00%
INFN-NAPOLI-CMS 0.89 PB 0.89 PB 0.89 PB 0.89 PB 3.58 PB 0.10%
INFN-NAPOLI-PAMELA 0 0.36 TB 0 0 0.36 TB 0.00%
INFN-PADOVA 0.58 PB 0.60 PB 0.58 PB 0.57 PB 2.34 PB 0.06%
INFN-PAVIA 0 0.26 PB 0 0 0.26 PB 0.00%
INFN-PERUGIA 0 0 0 0 0 0.00%
INFN-PISA 0.02 TB 0.02 TB 0.25 EB 0.02 TB 0.26 EB 7.68%
INFN-ROMA1 0 13.08 PB 0 0 13.08 PB 0.38%
INFN-ROMA2 0 241.68 TB 0 0 241.68 TB 0.00%
INFN-ROMA3 0 5.70 PB 0 0 5.70 PB 0.16%
INFN-T1 164.64 PB 0.45 EB 0.32 EB 1.30 EB 2.26 EB 66.14%
INFN-TORINO 0.29 PB 0.29 PB 0.29 PB 0.29 PB 1.16 PB 0.03%
INFN-TRIESTE 238.56 TB 5.25 PB 4.34 PB 238.56 TB 10.04 PB 0.29%
INFN-PISA 0 0 0 0 0 0.00%
UNINA-EGEE 0.82 PB 0.82 PB 0.82 PB 0.82 PB 3.30 PB 0.09%
Total 0.38 EB 0.86 EB 0.77 EB 1.82 EB 3.30 EB
Percentage 10.38% 26.76% 23.26% 40.06%
Click here for XML encoded data
Chart showing the Cumulative grouped by SITE and VO (only information about LHC VOs is returned).
Pie Chart showing the share in per VO (only information about LHC VOs is returned).
Developed by CESGA 'EGI View' : / resource_tb_used / 2013:2-2014:1 / SITE-VO / lhc (x) / - / i
2014-01-11 07:34
NGI_IT per VO
Developed by CESGA
WLCG
Worldwide LHC Computing Grid

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  - NGI_NDGF
  - NGI_NL
  - NGI_PL
  - NGI_RO
  - NGI_SI
  - NGI_SK
  - NGI_TR
  - NGI_UA
  - NGI_UK
  - NGI_ZA
  - ROC_Canada
  - ROC_LA
  - Russia

Storage View --> Production

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Refresh

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LHC VOs. February 2013 - January 2014.

The following table shows the distribution of grouped by SITE and DATE.

by SITE and DATE

SITE	Apr 2013	May 2013	Jun 2013	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Total	%
CNR-ILC-PISA	0	0	14.96 TB	31.62 TB	21.09 TB	10.00 TB	31.71 TB	23.30 TB	29.13 TB	13.33 TB	175.18 TB	0.00%
GARR-01-DIR	0	0	13.92 TB	31.14 TB	20.54 TB	9.79 TB	32.48 TB	23.86 TB	28.86 TB	13.40 TB	174.03 TB	0.00%
GILDA-INFN-CATANIA	0	0	2.32 TB	5.80 TB	3.48 TB	1.74 TB	5.41 TB	4.25 TB	5.02 TB	2.32 TB	30.18 TB	0.00%
GRISU-COMETA-INFN-CT	0	0	0	0	0	0	0	0	0	0	0	0.00%
GRISU-SPACI-NAPOLI	0	0	0.02 TB	0.05 TB	0.03 TB	0.02 TB	0.11 TB	0.08 TB	0.10 TB	0.04 TB	0.49 TB	0.00%
GRISU-UNINA	0	0	47.87 TB	110.28 TB	81.68 TB	39.68 TB	132.23 TB	95.41 TB	116.15 TB	44.63 TB	0.86 PB	0.01%
INFN-BARI	23.15 PB	45.33 PB	43.40 PB	86.81 PB	52.08 PB	23.15 PB	86.81 PB	63.66 PB	75.24 PB	34.72 PB	0.62 EB	16.78%
INFN-BOLOGNA	5.87 TB	3.91 TB	14.67 TB	29.35 TB	18.59 TB	8.80 TB	30.49 TB	23.09 TB	27.29 TB	11.54 TB	173.86 TB	0.00%
INFN-BOLOGNA-T3	0.52 PB	1.28 PB	1.28 PB	2.63 PB	1.80 PB	0.86 PB	2.55 PB	1.38 PB	1.81 PB	0.84 PB	14.89 PB	0.44%
INFN-CATANIA	0.71 PB	1.78 PB	1.78 PB	3.56 PB	2.25 PB	1.06 PB	3.32 PB	1.89 PB	3.08 PB	1.42 PB	20.86 PB	0.61%
INFN-CNAF_LHCB	0	0	0	0	0	0	0	0	0	0	0	0.00%
INFN-COSENZA	17.55 TB	43.72 TB	45.69 TB	78.83 TB	34.96 TB	17.25 TB	40.22 TB	39.65 TB	57.83 TB	30.37 TB	0.38 PB	0.01%
INFN-FERRARA	0	0	0	0	0	0	0	0	0	0	0	0.00%
INFN-FRASCATI	228.68 TB	0.53 PB	0.71 PB	1.89 PB	0.90 PB	0.44 PB	1.56 PB	1.13 PB	1.31 PB	0.59 PB	9.40 PB	0.27%
INFN-GENOVA	89.07 TB	214.70 TB	214.82 TB	0.42 PB	0.26 PB	131.51 TB	0.46 PB	0.32 PB	0.39 PB	181.61 TB	2.88 PB	0.07%
INFN-LECCE	165.99 TB	0.42 PB	0.43 PB	0.85 PB	0.48 PB	0.25 PB	0.87 PB	0.64 PB	0.81 PB	0.36 PB	6.30 PB	0.16%
INFN-MILANO-ATLASC	4.76 PB	11.69 PB	11.82 PB	28.26 PB	18.21 PB	8.79 PB	31.11 PB	22.87 PB	25.23 PB	9.86 PB	172.84 PB	5.09%
INFN-NAPOLI-ARGO	0	0	3.63 PB	0	0	0	8.12 PB	5.17 PB	3.09 PB	0	21.03 PB	0.82%
INFN-NAPOLI-ATLAS	97.37 TB	249.07 TB	2.87 TB	7.78 TB	-248.73 TB	-154.55 TB	-1.85 PB	-53.16 TB	1.40 PB	0.31 PB	-0.27 PB	0.00%
INFN-NAPOLI-CMS	0	0	211.29 TB	0.83 PB	0.55 PB	0.26 PB	0.43 PB	63.48 TB	0.80 PB	0.34 PB	3.68 PB	0.10%
INFN-NAPOLI-PAMELA	0.01 TB	0.02 TB	0.02 TB	0.05 TB	0.03 TB	0.01 TB	0.05 TB	0.04 TB	0.07 TB	0.01 TB	0.38 TB	0.00%
INFN-PADOVA	1.41 TB	3.54 TB	191.77 TB	0.43 PB	0.27 PB	135.72 TB	0.42 PB	0.32 PB	0.38 PB	181.06 TB	2.24 PB	0.06%
INFN-PAVIA	1.19 TB	3.04 TB	20.01 TB	50.24 TB	9.36 TB	17.22 TB	57.42 TB	32.58 TB	58.77 TB	26.57 TB	0.26 PB	0.00%
INFN-PERUGIA	0	0	0	0	0	0	0	0	0	0	0	0.00%
INFN-PISA	3.05 PB	17.00 PB	17.67 PB	36.37 PB	23.31 PB	12.02 PB	46.31 PB	32.76 PB	46.09 PB	21.45 PB	0.26 EB	7.58%
INFN-ROMA1	0.42 PB	1.05 PB	1.00 PB	2.02 PB	1.32 PB	0.61 PB	2.18 PB	1.67 PB	2.00 PB	0.74 PB	13.06 PB	0.38%
INFN-ROMA2	2.37 TB	6.82 TB	6.71 TB	14.23 TB	8.55 TB	32.42 TB	145.26 TB	25.29 TB	0	0	241.89 TB	0.00%
INFN-ROMA3	186.91 TB	0.48 PB	0.49 PB	0.98 PB	0.61 PB	0.30 PB	0.68 PB	0.69 PB	0.85 PB	0.39 PB	6.70 PB	0.18%
INFN-T1	65.93 PB	172.17 PB	176.79 PB	0.36 EB	0.25 EB	113.12 PB	0.37 EB	0.26 EB	0.32 EB	158.63 PB	2.26 EB	65.14%
INFN-TORINO	0	96.70 TB	102.53 TB	205.07 TB	129.88 TB	61.52 TB	201.76 TB	161.47 TB	180.25 TB	82.03 TB	1.19 PB	0.03%
INFN-TRIESTE	0.27 PB	0.76 PB	0.86 PB	1.80 PB	1.01 PB	0.44 PB	1.45 PB	1.28 PB	1.45 PB	0.67 PB	10.04 PB	0.28%
SNS-PISA	0	0	0	0	0	0	0	0	0	0	0	0.00%
UNINA-EGEE	0	0	171.23 TB	0.51 PB	0.37 PB	195.75 TB	0.62 PB	0.49 PB	0.67 PB	0.26 PB	3.30 PB	0.09%
Total	99.82 PB	263.16 PB	0.26 EB	0.63 EB	0.36 EB	181.89 PB	0.66 EB	0.38 EB	0.45 EB	231.23 PB	3.30 EB	
Percentage	2.84%	7.47%	7.70%	18.06%	10.73%	4.78%	18.81%	11.87%	14.65%	8.82%		

Click here for XML encoded data

Chart showing the Cumulative grouped by SITE and DATE (only information about LHC VOs is returned).

Developed by CESGA EGI View: / resource_tb_used / 2013-2-2014-1 / SITE-DATE / lhc (x) / GRBAR-LIN / i

2014-01-11 07:34

Developed by CESGA

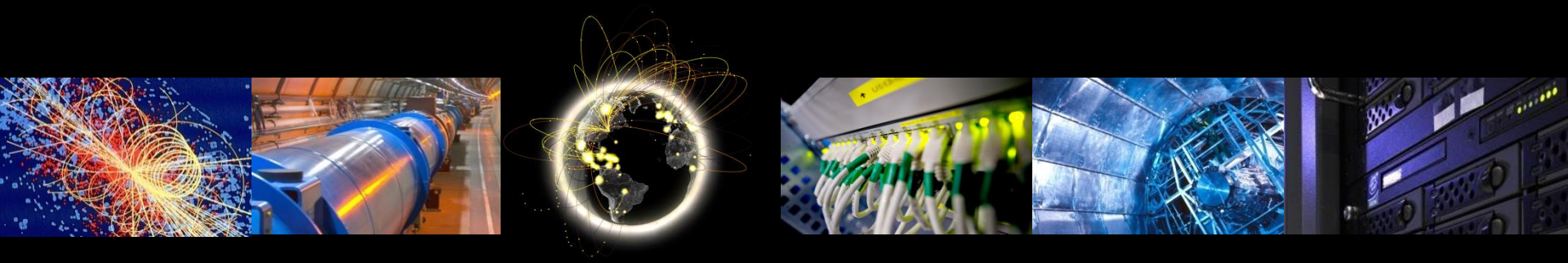
WLCG Worldwide LHC Computing Grid

Next

- We will continue to test with a variety of sites to see if there are site issues which affect publishing
- Target the Tier1s in order to produce a storage report that could be shown to C-RRB
- Discuss with Italy extending their publishing to other sites.

Cloud Accounting

John Gordon, STFC

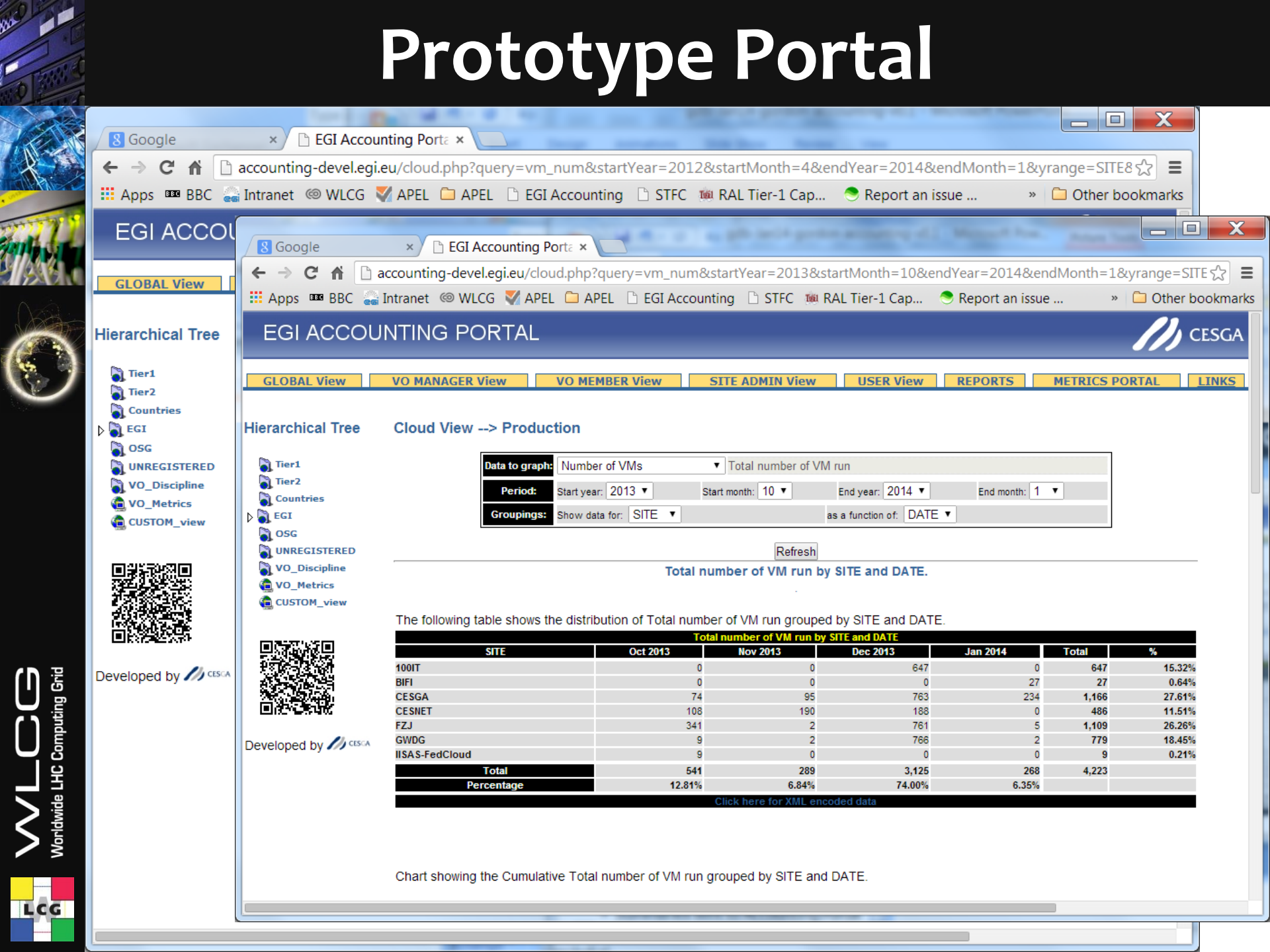


WLCG
Worldwide LHC Computing Grid

EGI Federated Cloud

- EGI Testbed has a variety of sites and VM Management systems.
- A script queries the VMM database and cuts a Cloud Usage Record (based on OGF UR v1.1)
  - UR definition already included fields like Memory, disk I/O. Network I/O
- SSM is used to send to APEL.
- Script available for OpenNebula, StratusLab, OpenStack
- Summaries sent to Accounting Portal

Prototype Portal



WLCG Worldwide LHC Computing Grid

EGI prognosis

- EGI plan production service by April
- Accounting will be one of the core servioces
- (As for CPU) APEL will take data from anyone and present multiple views of it.

  Have already taken test data from CERN
- WLCG-specific views possible (mainly portal work).

WLCG Issues

- Normalisation – benchmarking
  - Long discussion at pre-GDB
  - Machine features look useful for this. Visible inside VM and known to VMM. Accounting should be able to access this.
- Merging Grid and Cloud Data
  - Portal can do this in a similar way to how it treats local and grid jobs today (Grid, Local, Grid+Local)
- Including data from commercial and other bill-issuing clouds.
  - Develop a parser for bills
- To Give a global view of an experiment's usage.
- Alternatives to infrastructure accounting
  - Cut accounting records in other places
  - e.g. Experiment workload management could permit accounting per workload rather than per pilot job

Next

- Take experiment data from CERN (and any other PP cloud)
- Create merged data view in portal
- Look at utilisation levels for VMs
- Encourage ‘machine features’ to include a benchmark component.

Postscript

- The release of GocDB 5.2 will see the addition of key value pairs for both the site and service endpoint entities.
- With these sites will be able to define their own custom key properties to define attributes. A key value pair can be entered, edited and deleted for a site or service via the web portal by users with a managing role of the entity
- The PI will allow anyone to gather they values for all sites for which they are set.
- This might be useful to WLCG or experiments to define a class of sites.
- A future talk?