

Accounting Portal new developments

A brief look of last year's developments

Iván Díaz
Álvaro Simón

CESGA



Under the Hood

View Improvements

New functionality

InterNGI usage reporting

Cloud Accounting

Under the Hood

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Cloud Accounting

- Both production and development servers were migrated from SL4 to SL6.2
- Reinstallation needed as migration path, used to discontinue legacy software and upgrade security.
- Since the servers were fully virtualized, there were no physical implications (connectivity, physical security, refrigeration, etc..)
- Users noticed significant performance increases.
- New versions for supporting services (PHP 5, Apache 2.3).

- Great refactoring and reorganization, removing of legacy code.
- Integration of several branches on a single codebase and distributed repository
- Reduction of 10K+ lines in the codebase.
- Since PHP URL tree organization is directly linked to code structure, instrumental on URL reorganization.
- There was a strong increase on row count on some tables and query execution.
- Index traditionally penalize writing operations (since they force maintenance). Since write operations are limited to the backend and off-hours, index creation can be aggressive.
- Some queries were reformulated using constructs that were less expensive on MySQL.

Under the Hood

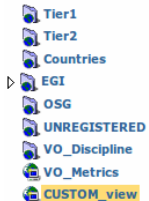
View Improvements


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- The site was based on old frameset technology, this technology works with all HTML servers and clients, but has several negative points:
 - Imposes a fixed minimum width on devices - problems with mobile devices.
 - Pages are not directly accessible with an URL - big problems with bug reporting.
 - Linking from inside pages is complex, and external linking and page inclusion is not possible.
 - It greatly complicated the code organization, since each frame requires a separate HTML file.
- The frame based interface was replaced with a visually equivalent HTML+CSS one that solved all these problems.



Developed by  CESA

- Support made possible with HTML+CSS migration.
- A QR code representing the current URL was added on the sidebar.
 - Useful to synchronize mobile devices with desktop ones.
 - Printable and directly recuperable, so suited to paper reports.
 - There is no upper limit for the URL represented, but in extreme cases it can be too much finely detailed to some mobile cameras.

- The graphs were improved following a RT requirement.
- The improvements were done in order to improve clarity and feasibility for including in reports.
- The size was increased to make use of high resolution devices since there was enough bandwidth and the graphs are highly compressible with PNG.
- The improvements on graphing are a WIP, further updates will be given.

Under the Hood

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- The XML datafeeds were created to provide a direct data interface for NA3 and VRC related tasks.
- The resulting interface was derived from the existing CSV one and made public on the custom view.
- Several parties used it (after extension in some cases) and solicited its generalization to all views.

| | | | | | | |
|-------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------|
| NGL_MD | 0 | 0 | 0 | 2 | 2 | 0.00% |
| NGL_NDGF | 6,809,168 | 7,127,344 | 6,226,327 | 5,487,578 | 25,650,417 | 2.31% |
| NGL_NL | 14,938,713 | 14,290,743 | 14,999,695 | 15,978,293 | 69,297,444 | 5.43% |
| NGL_PL | 3,192,261 | 3,814,287 | 3,894,750 | 4,261,498 | 15,912,261 | 1.43% |
| NGL_RO | 2,736,643 | 2,692,305 | 1,509,817 | 1,817,245 | 8,758,010 | 0.79% |
| NGL_SI | 5,535,344 | 5,428,325 | 5,624,800 | 5,404,419 | 21,992,888 | 1.99% |
| NGL_SR | 309,153 | 209,861 | 241,087 | 383,690 | 1,543,791 | 0.19% |
| NGL_TR | 2,893,329 | 2,792,845 | 1,917,172 | 1,722,315 | 9,135,261 | 0.82% |
| NGL_UA | 162,134 | 307,339 | 306,412 | 434,498 | 1,260,383 | 0.11% |
| NGL_UK | 42,267,728 | 39,215,676 | 37,808,675 | 36,999,259 | 158,291,338 | 14.27% |
| RDC_Canada | 18,205,790 | 21,943,639 | 21,853,798 | 19,195,200 | 89,832,437 | 7.28% |
| RDC_GAALC | 76,465 | 41,990 | 22,907 | 40,420 | 181,732 | 0.02% |
| RDC_LA | 425,177 | 362,062 | 393,769 | 276,332 | 1,477,340 | 0.13% |
| Russia | 7,661,752 | 7,043,842 | 7,694,868 | 8,685,617 | 31,086,079 | 2.89% |
| Total | 272,872,914 | 268,690,970 | 273,131,150 | 284,841,617 | 1,199,536,651 | |
| Percentage | 24.99% | 24.22% | 24.62% | 26.57% | | |

[Click here for a CSV dump of this table](#)
[Click here for XML extended data](#)

- Thus, a generalized XML interface for tree views was implemented.
- The users can give parameters using the web site and retrieve a URL endpoint.
- This endpoint can be treated as a black box, or used programmatically.
- Unfortunately, the interface is too internal to document it fully, so there are plans for a higher-level interface.

- Some users requested to be able to see all users on certificate-restricted views (VO Manager, Site Manager, etc..)
- Graphs were also updated to support the display of arbitrary numbers of users.

The following table shows the Usage of the Users ordered by Normalised CPU time (kSIZK) and the Total Usage of the Other Users. A detailed view can be obtained by selecting an individual user.

| VO Users ordered by Normalised CPU time (kSIZK) | | | | | | | | | | | | | | | | | | |
|---|---------|--------|-------|--|----------|-------|--|----------------|-------|--|---------|-------|--|----------------|-------|---------------|-------|----------|
| # | User ID | Jobs | | | CPU time | | | Norm. CPU time | | | WCT | | | CPU Efficiency | | Avg. CPU time | | Avg. WCT |
| | | # | % | | Hrs | % | | Hrs | % | | Hrs | % | | % | Hrs | | Hrs | |
| 1 | User 1 | 39,634 | 14.1% | | 232,962 | 26.2% | | 557,944 | 26.2% | | 245,394 | 22.7% | | 567,716 | 22.7% | 98.8 | 5.88 | 6.19 |
| 2 | User 2 | 20,511 | 7.3% | | 130,619 | 14.7% | | 312,831 | 14.7% | | 180,118 | 16.7% | | 431,363 | 16.7% | 72.3 | 6.37 | 8.78 |
| 3 | User 3 | 20,154 | 7.2% | | 128,348 | 14.4% | | 307,389 | 14.4% | | 171,646 | 15.9% | | 411,090 | 15.9% | 74.8 | 6.37 | 8.52 |
| 4 | User 4 | 16,866 | 6.0% | | 98,299 | 11.0% | | 235,427 | 11.0% | | 117,532 | 10.9% | | 281,489 | 10.9% | 83.6 | 5.82 | 6.96 |
| 5 | User 5 | 3,538 | 1.3% | | 57,698 | 6.5% | | 138,185 | 6.5% | | 94,178 | 8.7% | | 225,558 | 8.7% | 81.3 | 16.31 | 26.62 |
| 6 | User 6 | 6,669 | 3.1% | | 44,903 | 5.0% | | 107,546 | 5.0% | | 49,087 | 4.5% | | 117,515 | 4.5% | 39.8 | 5.16 | 5.64 |
| 7 | User 7 | 11,871 | 4.2% | | 44,218 | 5.0% | | 105,904 | 5.0% | | 49,104 | 4.5% | | 117,604 | 4.5% | 90.3 | 3.72 | 4.14 |
| 8 | User 8 | 4,713 | 1.7% | | 42,535 | 4.8% | | 101,872 | 4.8% | | 43,356 | 4.0% | | 103,838 | 4.0% | 96.1 | 8.03 | 9.20 |
| 9 | User 9 | 4,210 | 1.5% | | 33,597 | 3.8% | | 80,464 | 3.8% | | 36,742 | 3.4% | | 87,996 | 3.4% | 91.9 | 7.98 | 8.73 |
| 10 | User 10 | 15,270 | 5.6% | | 18,769 | 2.1% | | 44,954 | 2.1% | | 18,862 | 1.8% | | 45,339 | 1.8% | 35.6 | 3.56 | 3.60 |
| 11 | User 11 | 1,615 | 0.6% | | 12,053 | 1.4% | | 29,938 | 1.4% | | 12,627 | 1.2% | | 30,243 | 1.2% | 96.2 | 7.48 | 7.72 |
| 12 | User 12 | 338 | 0.1% | | 3,842 | 0.4% | | 23,571 | 1.1% | | 10,054 | 0.9% | | 24,080 | 0.9% | 97.9 | 29.29 | 29.92 |
| 13 | User 13 | 2,752 | 1.0% | | 7,611 | 0.9% | | 18,227 | 0.9% | | 7,796 | 0.7% | | 18,647 | 0.7% | 79.8 | 2.77 | 2.83 |
| 14 | User 14 | 4,628 | 2.4% | | 15,543 | 1.8% | | 13,288 | 0.6% | | 6,127 | 0.6% | | 15,846 | 0.6% | 99.1 | 6.84 | 6.94 |
| 15 | User 15 | 4,125 | 1.5% | | 3,694 | 0.4% | | 8,849 | 0.4% | | 8,020 | 0.7% | | 19,209 | 0.7% | 96.1 | 0.90 | 1.94 |
| 16 | User 16 | 96 | 0.0% | | 2,982 | 0.3% | | 7,168 | 0.3% | | 3,005 | 0.3% | | 7,196 | 0.3% | 96.1 | 31.17 | 31.30 |
| 17 | User 17 | 870 | 0.3% | | 2,680 | 0.3% | | 6,430 | 0.3% | | 3,759 | 0.3% | | 8,993 | 0.3% | 71.5 | 3.09 | 4.32 |
| 18 | User 18 | 398 | 0.3% | | 2,250 | 0.3% | | 6,059 | 0.3% | | 2,553 | 0.2% | | 6,114 | 0.2% | 98.8 | 2.58 | 2.62 |
| 19 | User 19 | 8,465 | 3.0% | | 2,099 | 0.2% | | 5,029 | 0.2% | | 2,300 | 0.2% | | 5,508 | 0.2% | 91.3 | 0.25 | 0.27 |
| 20 | User 20 | 1,960 | 0.7% | | 2,020 | 0.2% | | 4,840 | 0.2% | | 2,285 | 0.2% | | 5,438 | 0.2% | 89.2 | 1.02 | 1.14 |
| 21 | User 21 | 115 | 0.0% | | 1,830 | 0.2% | | 4,395 | 0.2% | | 1,910 | 0.2% | | 4,573 | 0.2% | 96.1 | 15.96 | 16.61 |
| 22 | User 22 | 193 | 0.1% | | 1,243 | 0.2% | | 3,217 | 0.2% | | 1,382 | 0.1% | | 3,237 | 0.1% | 98.8 | 6.36 | 6.56 |
| 23 | User 23 | 965 | 0.4% | | 1,080 | 0.1% | | 2,596 | 0.1% | | 1,349 | 0.1% | | 3,230 | 0.1% | 90.1 | 1.05 | 1.36 |
| 24 | User 24 | 298 | 0.1% | | 640 | 0.1% | | 1,532 | 0.1% | | 861 | 0.1% | | 2,061 | 0.1% | 74.3 | 2.15 | 2.89 |
| 25 | User 25 | 460 | 0.2% | | 485 | 0.1% | | 1,163 | 0.1% | | 1,381 | 0.1% | | 3,308 | 0.1% | 35.1 | 1.05 | 3.00 |
| 26 | User 26 | 137 | 0.0% | | 459 | 0.1% | | 1,089 | 0.1% | | 465 | 0.1% | | 1,115 | 0.0% | 11.6 | 2.35 | 2.46 |
| 27 | User 27 | 78 | 0.0% | | 427 | 0.1% | | 1,022 | 0.0% | | 431 | 0.0% | | 1,051 | 0.0% | 96.1 | 5.82 | 5.67 |
| 28 | User 28 | 11,523 | 4.1% | | 273 | 0.0% | | 654 | 0.0% | | 910 | 0.1% | | 2,182 | 0.1% | 36.1 | 0.02 | 0.08 |
| 29 | User 29 | 42 | 0.0% | | 210 | 0.0% | | 503 | 0.0% | | 222 | 0.0% | | 532 | 0.0% | 99.8 | 5.00 | 5.29 |
| 30 | User 30 | 117 | 0.0% | | 150 | 0.0% | | 398 | 0.0% | | 151 | 0.0% | | 361 | 0.0% | 96.1 | 1.28 | 1.29 |
| 31 | User 31 | 5,946 | 2.1% | | 87 | 0.0% | | 209 | 0.0% | | 810 | 0.1% | | 1,940 | 0.1% | 36.2 | 0.01 | 0.14 |
| 32 | User 32 | 9 | 0.0% | | 71 | 0.0% | | 170 | 0.0% | | 71 | 0.0% | | 170 | 0.0% | 100.0 | 7.89 | 7.89 |
| 33 | User 33 | 2,928 | 1.0% | | 68 | 0.0% | | 162 | 0.0% | | 232 | 0.0% | | 555 | 0.0% | 29.9 | 0.02 | 0.08 |
| 34 | User 34 | 483 | 0.2% | | 52 | 0.0% | | 124 | 0.0% | | 59 | 0.0% | | 85 | 0.0% | 100.0 | 0.11 | 0.08 |
| 35 | User 35 | 18,591 | 6.6% | | 39 | 0.0% | | 96 | 0.0% | | 516 | 0.0% | | 1,238 | 0.0% | 36.2 | 0.00 | 0.03 |
| 36 | User 36 | 110 | 0.0% | | 36 | 0.0% | | 89 | 0.0% | | 128 | 0.0% | | 300 | 0.0% | 28.1 | 0.33 | 1.15 |
| 37 | User 37 | 2,213 | 0.8% | | 29 | 0.0% | | 71 | 0.0% | | 88 | 0.0% | | 210 | 0.0% | 31.1 | 0.01 | 0.04 |
| 38 | User 38 | 14,564 | 5.3% | | 21 | 0.0% | | 65 | 0.0% | | 531 | 0.0% | | 884 | 0.0% | 36.2 | 0.00 | 0.02 |
| 39 | User 39 | 578 | 0.2% | | 21 | 0.0% | | 50 | 0.0% | | 791 | 0.1% | | 1,870 | 0.1% | 33.1 | 0.04 | 1.35 |
| 40 | User 40 | 8,212 | 2.9% | | 19 | 0.0% | | 46 | 0.0% | | 232 | 0.0% | | 557 | 0.0% | 8.1 | 0.00 | 0.03 |
| 41 | User 41 | 6,111 | 2.2% | | 17 | 0.0% | | 44 | 0.0% | | 596 | 0.1% | | 1,429 | 0.1% | 23.1 | 0.00 | 0.10 |
| 42 | User 42 | 12,872 | 4.6% | | 16 | 0.0% | | 38 | 0.0% | | 337 | 0.0% | | 811 | 0.0% | 36.1 | 0.00 | 0.03 |

Under the Hood

View Improvements

New functionality

InterNGI usage reporting

Cloud Accounting

- The EGI Usage VT was created to produce a complete report of resource consumption between NGIs.
- A great part of the effort was involved with creating new views and reports on the Portal to measure this usage.
- The usage between NGIs and countries is based on existing UserDN data, which is mapped to an institution and this institution to a country and NGI.
- Actions were also taken to improve UserDN publishing and make the final report more useful.
- In the last TF, there were already usage statistics for each Site and Country.
- Since then, we have provision statistics, the Usage Matrix and the Publishing Matrix.

The Usage Matrix contains for each combination of two NGIs or countries:

- The consumption for the specified period in one of the usual CPU use measurements of the portal.
- Percentage relative to the total consumed on the column's NGI (blue)
- Percentage relative to the total consumed by the row's NGI (red)

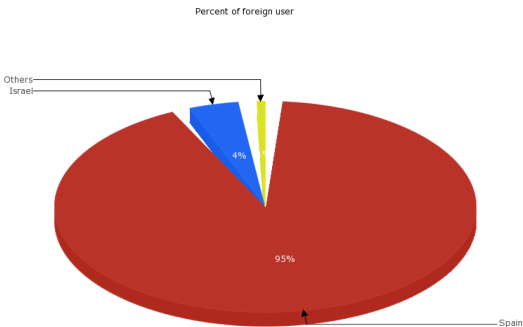
| Uses/Used by | AsiaPacific | CERN | EGLeu | NGI_AEGIS | NGI_AL | NGI_ARMGRID | NGI_BA |
|--------------|----------------------------|------------------------------|-------|-----------|--------|--------------------------|--------------------|
| AsiaPacific | 5722189 10.38% / 81.98% | 128422 0.02% / 1.39% | | | | | |
| CERN | 34406039 62.32% / 1.6% | 705399435 88.61% / 32.73% | | | | 34633 58.78% / 0% | |
| EGLeu | | | | | | | |
| NGI_AEGIS | | | | | | | |
| NGI_AL | | | | | | | |
| NGI_ARMGRID | | | | | | 22775 38.66% / 15.62% | |
| NGI_BA | | | | | | | 9 38.13% / 100% |
| NGI_ES | 7 | | | | | | |

The Publication Matrix monitors the quality of publishing for each NGI/country. It shows for a concrete period:

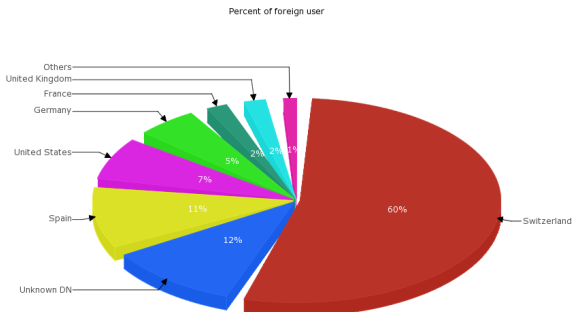
- Total sites, correctly publishing sites and percentage.
- CPU resources without a valid UserDN (selectable measurement).
- Percentage of measurement with correct UserDN.
- Users active on that period.

| Matrix of foreign UserDN publishing | | | | | | |
|-------------------------------------|-------------|------------------|-----------------------|--|---|--------------|
| Region | Total Sites | Publishing Sites | Percentage publishing | Normalised CPU time (kSI2K) without UserDN | Normalised CPU time (kSI2K) with UserDN (%) | Active Users |
| Armenia | 2 | 2 | 100% | 30943 | 65.6% | 5 |
| Australia | 1 | 1 | 100% | 2221637 | 66.3% | 2 |
| Austria | 2 | 2 | 100% | 1751746 | 42.1% | 8 |
| Belarus | 1 | 1 | 100% | 41147 | 37.9% | 2 |
| Belgium | 2 | 2 | 100% | 14537855 | 27.5% | 51 |
| Bosnia and Herzegovina | 1 | 1 | 100% | 59 | 26% | 1 |
| Brazil | 2 | 2 | 100% | 1880847 | 26.6% | |
| Bulgaria | 4 | 4 | 100% | 278253 | 41.1% | 11 |
| Canada | 6 | 6 | 100% | 27748630 | 83.6% | 10 |
| Chile | 1 | 1 | 100% | 0 | 100% | 1 |
| China | 2 | 2 | 100% | 7998954 | 27.9% | 20 |
| Croatia | 3 | 3 | 100% | 14119 | 67.9% | 6 |
| Cyprus | 1 | 1 | 100% | 26701 | 36.6% | 2 |
| Czech Republic | 2 | 2 | 100% | 4024680 | 66.1% | 13 |
| Denmark | 1 | 1 | 100% | 0 | 100% | 2 |
| Estonia | 1 | 1 | 100% | 63674 | 95.5% | 4 |
| Finland | 1 | 1 | 100% | 0 | 100% | 6 |
| France | 17 | 17 | 100% | 50 | 100% | 250 |

| Percentage of Users by country | | |
|--------------------------------|----------------|------------|
| Country | normcpu | Percentage |
| Spain | 1756293 | 95.33% |
| Israel | 72856 | 3.95% |
| Italy | 7023 | 0.38% |
| France | 5439 | 0.30% |
| Unknown DN | 359 | 0.02% |
| Germany | 162 | 0.01% |
| Greece | 70 | 0.00% |
| Switzerland | 46 | 0.00% |
| Portugal | 29 | 0.00% |
| Poland | 7 | 0.00% |
| Netherlands | 5 | 0.00% |
| Slovakia | 0 | 0.00% |
| China | 0 | 0.00% |
| United States | 0 | 0.00% |
| United Kingdom | 0 | 0.00% |
| Finland | 0 | 0.00% |
| Czech Republic | 0 | 0.00% |
| Korea | 0 | 0.00% |
| Total | 1842289 | |



| Percentage of Users by country | | |
|--------------------------------|------------------|------------|
| Country | normcpul | Percentage |
| Switzerland | 61720060 | 59.54% |
| Unknown DN | 12228299 | 11.80% |
| Spain | 11151396 | 10.76% |
| United States | 7750569 | 7.48% |
| Germany | 5626623 | 5.43% |
| France | 1945991 | 1.88% |
| United Kingdom | 1935599 | 1.87% |
| Italy | 354615 | 0.34% |
| Belgium | 306778 | 0.29% |
| Israel | 273176 | 0.26% |
| China | 104259 | 0.10% |
| Portugal | 91379 | 0.09% |
| Taiwan | 54106 | 0.05% |
| Poland | 41343 | 0.04% |
| Austria | 24119 | 0.02% |
| Morocco | 15618 | 0.02% |
| Croatia | 14367 | 0.01% |
| Russia | 7203 | 0.01% |
| Netherlands | 5304 | 0.01% |
| Colombia | 4932 | 0.00% |
| Pakistan | 2047 | 0.00% |
| Brasil | 1195 | 0.00% |
| Turkey | 783 | 0.00% |
| Greece | 717 | 0.00% |
| Finland | 658 | 0.00% |
| Ukraine | 312 | 0.00% |
| Hungary | 22 | 0.00% |
| Bulgaria | 10 | 0.00% |
| India | 7 | 0.00% |
| Azerbaijan | 0 | 0.00% |
| Mexico | 0 | 0.00% |
| Czech Republic | 0 | 0.00% |
| Japan | 0 | 0.00% |
| Cyprus | 0 | 0.00% |
| Argentina | 0 | 0.00% |
| Korea | 0 | 0.00% |
| Venezuela | 0 | 0.00% |
| Canada | 0 | 0.00% |
| Slovakia | 0 | 0.00% |
| Total | 103655487 | |



Under the Hood

View Improvements

New functionality

InterNGI usage reporting

Cloud Accounting

- The Portal was expanded to include a Cloud accounting view.
- The data is received on a separated DB using SSM.
- The schema is different than usual Grid accounting, and is still evolving.
- The records are received from several RPs, and it has enough volume to benefit from summarization.

| | | | | |
|-----------------------|-----------------------|--------------------------|------------------|----------------|
| Data to graph: | Number of VMs ▼ | Total number of VM run | | |
| Period: | Start year: 2012 ▼ | Start month: 5 ▼ | End year: 2013 ▼ | End month: 4 ▼ |
| Groupings: | Show data for: SITE ▼ | as a function of: DATE ▼ | | |

The query set is slightly different than that of Grid, but includes Network and Disk metrics.

- Number of VMs - Aggregate number of VMs executed on the site.
- Sum CPU time - Total active CPU time for all VMs
- Sum Elapsed time - Total wall clock time for all VMs
- Inbound Network Traffic - Total inbound traffic received by VMs
- Outbound Network Traffic - Total outbound traffic sent by VMs.
- Memory Used - Total memory allocated (not used) by VMs.
- Disk Used - Total disk space allocated (not used) by VMs.

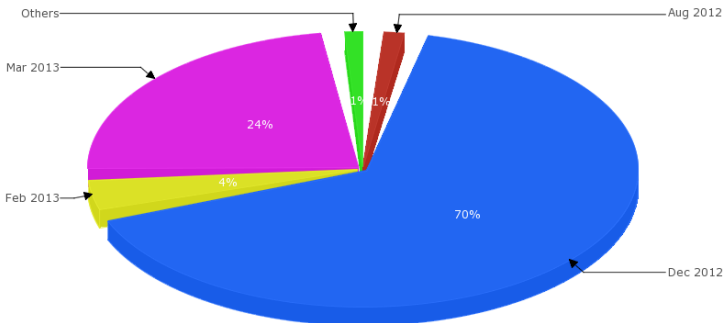
| | | | | |
|-----------------------|-----------------------|--------------------------|------------------|----------------|
| Data to graph: | Number of VMs ▼ | Total number of VM run | | |
| Period: | Start year: 2012 ▼ | Start month: 5 ▼ | End year: 2013 ▼ | End month: 4 ▼ |
| Groupings: | Show data for: SITE ▼ | as a function of: DATE ▼ | | |

- The results are presented in a HTML table and also made available as XML.
- The table has two dimensions that can be assigned to Site, Date or VO.
- Values can also be filtered by start and end date.
- Totals and percentages are calculated for each dimension and the whole of the table.

| Total number of VM run by SITE and DATE | | | | | | | | |
|---|--------------|--------------|---------------|--------------|--------------|---------------|--------------|--------|
| SITE | Oct 2012 | Nov 2012 | Dec 2012 | Jan 2013 | Feb 2013 | Mar 2013 | Total | % |
| CESGA | 0 | 0 | 1,017 | 0 | 13 | 458 | 1,488 | 26.32% |
| CESNET | 2 | 0 | 1,497 | 0 | 46 | 820 | 2,365 | 41.84% |
| FZJ | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0.05% |
| GRIF | 0 | 0 | 7 | 0 | 0 | 0 | 7 | 0.12% |
| GWDG | 0 | 0 | 1,487 | 0 | 17 | 0 | 1,504 | 26.61% |
| IISAS-Bratislava | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.02% |
| IN2P3-CC | 0 | 0 | 0 | 0 | 0 | 11 | 11 | 0.19% |
| KTH CLOUD | 7 | 44 | 0 | 1 | 134 | 88 | 274 | 4.85% |
| Total | 9 | 44 | 4,008 | 1 | 210 | 1,381 | 5,653 | |
| Percentage | 0.16% | 0.78% | 70.90% | 0.02% | 3.71% | 24.43% | | |

[Click here for XML encoded data](#)

- Graphs are also produced for each dimension, detailing the distribution for each value.



There are several directions in which to improve

- Better integration with normal Grid accounting.
- UserDN accounting, with privileged views.
- Better crossover of information with GOCDB.
- VM Application accounting.
- Internal VM Accounting?