e-FISCAL questionnaire

1. e-FISCAL survey overview

The e-FISCAL project will build a cost model using anonymised real data to create a total yearly cost of ownership measure. This model will allow service providers and user communities to identify areas where the overall cost efficiency of ICT-enabled research can be optimised and provide useful input for their long-term sustainability planning. It assists planning by identifying the e-Infrastructure cost factors on a cost item basis. The scope includes analysing the costs and cost structures of the European High-Throughput and High-Performance Computing (HTC and HPC) and comparing the costs and the cost structures of these research e-Infrastructures with similar commercial leased or on-demand offerings. The comparison would go beyond a simple “cost per core hour” comparison by identifying and analysing the qualitative differences in service (such as quality of service and availability) between HTC or HPC e-Infrastructures and their closest commercial counterparts. A more detailed description of the project as well as an overview of the model are found in appendix A.
The questionnaire is targeted not only to NGIs and national HPC coordinators, but also to individual HTC/HPC centres. This is due to the fact that some key information (such as energy or auxiliary costs) is usually available at such (HTC/HPC centre) level. The questionnaire has two main sections. The first covers the necessary input data for the calculation of the total yearly cost of ownership: amortized investment costs and operating expenses. Therefore there are questions referring to the investment in e-infrastructure elements (hardware, computing storage, interconnect equipment and auxiliary equipment) as well as operating expenses related questions (e.g. personnel, electricity, premises costs). The generic cost model used in the study accompanied by benchmarking metrics produced by the analysis of the data will become public on the project’s website. The second section is related to the sustainability outlook and Green IT aspects where questions about the current and future use of services by commercial service providers are discussed.
Data provided will be compared with existing accounting data available at a central level (such as EGI.eu accounting portal). The answers given will be considered as strictly confidential and only statistically processed results that guarantee anonymity will be publishable. For this reason even partially completed questionnaires are valuable for the project. Furthermore, the data will not be made public even after the project lifetime. For any questions related to the survey please contact survey@efiscal.eu.
This effort is funded by the FP7 EC project e-FISCAL (www.e-fiscal.eu).

Your participation is highly appreciated!

2. General information

1. To which e-infrastructure is your institute’s infrastructure part of ?

- [ ] NGI/EGI
- [ ] National HPC infrastructure/PRACE
- [ ] Both
- [ ] Other (please specify)

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2. What type of services does your institute provide ?

- [ ] Coordination (no resources)
- [ ] Computing services (CPU, storage, etc.)
- [ ] Both

3. Is your institute an ?

- [ ] NGI (coordinating body)
- [ ] NGI Resource Centre (CPU, storage, etc.)
- [ ] PRACE country coordinator
- [ ] HPC centre
- [ ] Other (please specify)

4. Country:

5. Position of respondent(s):

1.
2.
3.
4.

6. Name of respondent(s):

1.
2.
3.
4.

7. E-mail(s)of respondent(s):

1.
2.
3.
4.

8. Please identify the name or names of the infrastructure (HPC or HTC) and the sites the information provided refers to:

3. Computing and Storage hardware costs

Computing and storage are assumed to mainly include the cost of CPUs and the cost of storage devices.

1. Please present information in relation to the total number of "logical" CPUs (i.e. number of processing cores) of the NGI site/ HPC Centre available at the end of years 2010 and 2011.

Logical CPUs (number of processing cores) as on 31/12/2010	
Logical CPUs (number of processing cores) as on 31/12/2011	

2. Please provide a brief description of the hardware deployed (most popular configuration(s)) in your site/centre:
e.g. IBM Blade Centre H, 2 Intel Westmere CPU x 5650, six core/CPU @ 2.66Ghz each, 6x 4GB DIMM (24GB), 1x500GB, 7,200RPM SATA HDD

3. Please identify the months of logical CPU wall clock time (http://en.wikipedia.org/wiki/Wall_clock_time) for years 2010 and 2011(in months/year).

Months of Logical CPU wall clock time in 2010	
Months of Logical CPU wall clock time in 2011	

4. Please present information in relation to the TB of storage devices available in the NGI site/ HPC Centre at the end of year 2010 and at the end of year 2011.

Disk Storage in TB as on 31/12/2010	
Disk Storage in TB as on 31/12/2011	
Tape Storage in TB as on 31/12/2010	
Tape Storage in TB as on 31/12/2011	

5. Please present the average acquisition (i.e. purchase) cost per logical CPU and the average cost per TB acquisition in 2010 and 2011.
In case you have no data for 2011 please use approximations based on the most recent procurements or budget data.
Note: Please do not include any hardware support contract costs or software costs in the values presented below

Cost per logical CPU in € in 2010	
Cost per logical CPU in € in 2011	
Cost per TB/ Tapes in € in 2010	
Cost per TB/ Tapes in € in 2011	
Cost per TB/ Disks in € in 2010	
Cost per TB/ Disks in € in 2011	

6. Please indicate the period in number of years that corresponds to the average useful economic life (depreciation period) of the following assets according to the policy followed by the NGI site/ HPC Centre.

Average useful life in years for CPUs	
Average useful life in years for tape storage devices	
Average useful life in years for disk storage devices	

7. Please present an overall estimation of the related interconnect equipment costs (network devices, cables, etc.) as a percentage of the hardware acquisition cost
either as a percentage [] % (e.g. 10%, tick one box)
or as a range between [] % to [] % (e.g. between 10% to 15%, tick two boxes)
Please use objective assumptions informed by recent procurement data
Note: In case interconnect equipment costs are not a separate line item and they are already included in the overall procurement costs please tick 0%

	0%	5%	10%	15%	20%	25%	30%	35%	40%	50%
Percentage/range	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

8. Please present an overall estimation of the support contract costs (e.g. next-business-day hardware support costs) as a percentage of the hardware (CPUs and storage devices) acquisition cost
either as a percentage [] % (e.g. 5%, tick one box)
or as a range between [] % to [] % (e.g. between 5% to 10%, tick two boxes).
Please use objective assumptions informed by recent procurement data

	0%	3%	5%	7%	10%	12%	15%	18%	20%	25%	30%
Percentage/range	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

4. Auxiliary Equipment costs

Auxiliary equipment costs refer to the cost of several auxiliary infrastructure elements. These elements include UPSs, cooling devices, power related devices, etc.

1. If you were to equip the existing NGI site/ HPC Centre now what would be the investment cost of all auxiliary equipment as percentage of the cost of acquiring computing and hardware storage capacity either as a percentage [] % (e.g. 20%, tick one box) or as a range between [] % to [] % (e.g. between 20% to 30%, tick two boxes)

	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%
Percentage/range	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

2. Please identify whether the NGI site/ HPC Centre possesses the following infrastructure elements.

- ☐ UPS
- ☐ Air Cooling
- ☐ Liquid Cooling
- ☐ Other (please specify)
- ☐ Power Generators
- ☐ Power Transformers

5. Software costs

Software costs are assumed to consist mainly of the cost of the operating systems, the middleware and the applications.

1. Please make an estimation of the total cost of the related software (e.g. operating system, fabric layer / file system software (e.g. LSF, GPFS), software support contract costs, applications cost, 3rd party software cost, compilers, etc.) in 2010 and 2011.

Operating Systems/Middleware/File Systems or similar software in € in 2010	
Applications/3rd Party Software/SDKs/Libraries/Compilers or similar software in € in 2010	
Support contract or other software in € in 2010	
Operating Systems/Middleware/File Systems or similar software in € in 2011	
Applications/3rd Party Software/SDKs/Libraries/Compilers or similar software in € in 2011	
Support contract or other software in € in 2011	

2. Please make an estimation of the total cost of the related software (e.g. operating system, fabric layer / file system software (e.g. LSF, GPFS), software support contract costs, applications cost, 3rd party software cost, compilers, etc.) as a percentage of the hardware (CPUs and storage devices) acquisition cost
either as a percentage [] % (e.g. 5%, tick one box)
or as a range between [] % to [] % (e.g. between 5% to 10%, tick two boxes).
Please use objective assumptions informed by recent procurement data

	0%	3%	5%	7%	10%	12%	15%	17%	20%	22%	25%
Percentage/range	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

6. Personnel costs

Personnel costs mainly comprise the salary costs of the FTEs that work on the NGI site/ HPC Centre.
You could either complete question 1 or questions 2 and 3.

1. Please provide the following information related to the cost of the personnel for 2010 and 2011 as well as an average yearly salary per FTE.

Number of FTEs in 2010	
Number of FTEs in 2011	
Average yearly salary cost per FTE (gross salary plus employee benefits and bonuses) in ‘000 € in 2010	
Average yearly salary cost per FTE (gross salary plus employee benefits and bonuses) in ‘000 € in 2011	

2. Please provide the following information related to the number of FTEs per personnel category for 2010 as well as an average yearly salary per FTE (gross salary plus employee benefits and bonuses) in '000 €.

2010

Administrators FTEs	
Administrators average yearly salary cost	
Operators FTEs	
Operators average yearly salary cost	
Middleware developers FTEs	
Middleware developers average yearly salary cost	
Application developers FTEs	
Application developers average yearly salary cost	
Trainers FTEs	
Trainers average yearly salary cost	
Dissemination persons FTEs	
Dissemination persons average yearly salary cost	
Policy makers FTEs	
Policy makers average yearly salary cost	
Managers FTEs	
Managers average yearly salary cost	

3. Please provide the following information related to the number of FTEs per personnel category for 2011 as well as an average yearly salary per FTE (gross salary plus employee benefits and bonuses) in '000 €.

2011

Administrators FTEs	
Administrators average yearly salary cost	
Operators FTEs	
Operators average yearly salary cost	
Middleware developers FTEs	
Middleware developers average yearly salary cost	
Application developers FTEs	
Application developers average yearly salary cost	
Trainers FTEs	
Trainers average yearly salary cost	
Dissemination persons FTEs	
Dissemination persons average yearly salary cost	
Policy makers FTEs	
Policy makers average yearly salary cost	
Managers FTEs	
Managers average yearly salary cost	

7. Site operating costs

The NGI site/ HPC Centre operation causes operating costs that mainly relate to electricity and occupancy costs.

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1. Please fill in the following information related to the cost and operating characteristics of the NGI site/ HPC Centre for 2010 and 2011.
Note 1: Cooling may include heating during winter in cases of very low temperatures in the sites.
Note 2: Power Usage Effectiveness (http://en.wikipedia.org/wiki/Power_usage_effectiveness).

Site/Centre hosting space in m2 in 2010	
Site/Centre hosting space in m2 in 2011	
Total yearly electricity consumption for hosting (everything included i.e. servers, storage, networking, cooling, lighting, UPS systems, etc.) in MWh in 2010	
Total yearly electricity consumption for hosting (everything included i.e. servers, storage, networking, cooling, lighting, UPS systems, etc.) in MWh in 2011	
Total yearly electricity consumption for IT (including servers, storage devices and networking equipment) in MWh in 2010	
Total yearly electricity consumption for IT (including servers, storage devices and networking equipment) in MWh in 2011	
Power Usage Effectiveness (PUE) in 2010	
Power Usage Effectiveness (PUE) in 2011	
Ratio of computing to cooling electricity consumption in 2010	
Ratio of computing to cooling electricity consumption in 2011	

8. Network Connectivity costs

Network connectivity costs refer to leases paid for connection to the Internet/NREN.

1. Does your institute pay for network connectivity to Internet/NREN?

- ◯ Yes
- ◯ No
- ◯ I dont'know

2. Do your institute's site(s)/centre(s) have dedicated line(s) to your NREN or Internet?

- ◯ Yes
- ◯ No
- ◯ I dont'know

3. Please present the network connectivity cost and bandwidth of access line(s) of the NGI site/ HPC Centre in 2010 and 2011. If any of the following information is not available, please answer N/A.

Connectivity costs in '000 € in 2010	
Connectivity costs in '000 € in 2011	
Bandwidth of access in Gbps as on 31/12/2010	
Bandwidth of access in Gbps as on 31/12/2011	

9. Other overhead costs

Other overhead costs refer to cost categories not covered by the previous questions

1. Please identify any other costs that are related to the NGI site/ HPC Centre that have not been covered by the previous questions (e.g. personnel training costs, training certifications, travelling expenses, participation to conferences costs, fees paid to the university/institute for hosting the site/centre, insurance fees, interest expenses on loans) as well as their amount for 2010 and 2011.

Total other costs in '000 € in 2010	
Total other costs in '000 € in 2011	

2. Please provide more information and examples for these overhead costs.

10. Sustainability outlook, cloud computing and Green IT questions

This section is related to the sustainability outlook, cloud computing and Green IT aspects. It includes questions for current actions and future prospects.

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1. Please present the break down of the NGI site/ HPC centre total funding for the period 2011-2012 in € '000.

Project funding (matching funds included) in 2010	
Non project funding (e.g. national budget subsidies) in 2010	
Revenues from service provision in 2010	
Other funding (please specify) in 2010	
Total funding in 2010	
Project funding (matching funds included) in 2011	
Non project funding (e.g. national budget subsidies) in 2011	
Revenues from service provision in 2011	
Other funding (please specify) in 2011	
Total funding in 2011	

2. Are you allowed to use your funding to buy Cloud related services?

	Yes	No
Project funding (matching funds included)	◯	◯
Non project funding (e.g. national budget subsidies)	◯	◯

3. Please answer the following questions in relation to the use of cloud computing in 2011:

Note: "Use" means free of charge

	Use	Buy
Did you use (buy) Infrastructure as a Service (e.g. Amazon EC2) in 2011?	☐	☐
Did you use (buy) Platform as a Service (e.g. Microsoft Azure) in 2011?	☐	☐
Did you use (buy) Software as a Service (e.g. Google Docs, Microsoft Live services) in 2011?	☐	☐
Did you use (buy) disk storage services from external providers in 2011?	☐	☐
Did you use (buy) tape storage services from external providers in 2011?	☐	☐

4. Please answer the following questions in relation to the use of cloud computing in the future:

	Use	Buy
Do you intend to use (buy) Infrastructure as a Service in the future?	☐	☐
Do you intend to use (buy) Platform as a Service in the future?	☐	☐
Do you intend to use (buy) Software as a Service in the future?	☐	☐
Do you intend to use (buy) disk storage services from external providers in the future?	☐	☐
Do you intend to use (buy) tape storage services from external providers in the future?	☐	☐

5. Please answer the following questions in relation to "Green IT" (http://en.wikipedia.org/wiki/Green_computing):

	Yes	No
Did you recycle CPUs or storage devices during 2011?	◯	◯
Do you plan to use some sort of “Green IT” in the future?	◯	◯
Had energy efficiency considerations influenced your acquisition decisions in 2011?	◯	◯
Did you make any changes in your hardware/software environment to increase the energy efficiency in 2011?	◯	◯
Did you use any form of “Green IT” in 2011?	◯	◯

Please provide more information about your "Green IT" actions and plans (Examples: innovative hardware, using renewable energy sources, efficient cooling systems or optimal data center locations, reusing the heat energy for other purposes. Also see: http://www.csc.fi/english/csc/news/news/data and http://www.pdc.kth.se/news/news-repository/excess-heat-from-pdcs-supercomputer-keeps-kth-building-warm)

6. Please answer the following sustainability related questions:

	Yes	No
Do you have a short-term (e.g. 1–3 years) capacity and business plan for your computing infrastructure?	◯	◯
Do you have a long-term (e.g. 3–5 years) capacity and business plan for your computing infrastructure?	◯	◯
Is there a provision of any kind of usage fees in the short-term plan?	◯	◯
Is there a provision of any kind of usage fees in the long-term plan?	◯	◯

11. Additional Comments

Please use the following space to make any comments you consider relevant to our study and share with us your ideas and experiences in costing issues.

1. Please make your comments/recommendations/suggestions.

2. Please let us know whether you have performed any local cost study that you would like to share with e-FISCAL or whether there are any costing/funding related challenges or achievements that you would like to get publicized. This material will be treated as confidential, unless an explicit, written permission to include it in the public State-of-the-art repository (http://www.efiscal.eu/state-of-the-art) prepared by the e-FISCAL project is given.

12. Appendix A

e-Fiscal will focus on:
1. Studying the dedicated HTC and HPC e-Infrastructure costs by surveying European National Grid Initiatives (NGIs) and national (or pan-European) HPC centres and analysing cost factors to better understand what e-Infrastructure related services are included in the infrastructure costs in different organisations.
2. Performing an approximation of the overall cost of the entire European HTC and HPC infrastructures on the basis of survey results supplemented by a cost model.
3. Comparing the costs calculated for dedicated HTC and HPC e-Infrastructures as well as their service characteristics with commercial leased and on-demand offerings, such as Amazon services (EC2, S3 and “HPC on the cloud”)
4. Communicate the results to the wider European e-Infrastructure community through active dissemination, contributions to policy formation and organisation of dedicated workshops. Input cost data will be gathered through questionnaires, interviews and workshops.

The methodology that we will use in order to approximate the total yearly cost of ownership is the following:
A) Simulation of the physical infrastructure:

We will approximate the investment cost of the infrastructure by taking into account the capacity in logical CPUs, storage devices, connectivity interconnection devices and auxiliary equipment and actual purchase values corresponding to each specific site/centre. Cross-checks with available accounting data will be performed.

B) Development of the financial model:

The financial model will be based on two pillars. The annualized cost of the simulated physical infrastructure and the operating cost of the physical infrastructure.

B1) Annualized cost of the simulated physical infrastructure. We will use the depreciation rates to annualize the cost of the physical infrastructure simulated in the first phase.

B2)Operating cost of the physical infrastructure. This cost dimension corresponds to the yearly costs for running the site/centre. Information about the operating costs will be gathered at a cost category level (e.g. personnel costs, electricity, etc.) in order to permit the performance of several cost break-down analyses and economies of scale assessments.

The total yearly cost of ownership will be calculated for years 2010 and 2011.

In all cases cross-checks with available data (from EGI, PRACE, market or other literature sources) will be performed.