

IT Team of Departamento de Engenharia Informática (DEI)

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Activities Report

Abstract—During our activity, we have kept the laboratories of DEI at Instituto Superior Técnico (IST) as close to optimal conditions as possible. This involved the prediction and analysis of possible future hazards, followed by measures to prevent them.

We have also provided help to students and teachers using the laboratories, providing them with clear instructions on the things they were having trouble with and taking measures to solve problems reported as quickly and efficiently as possible.

When we had time we helped further develop a dashboard which will be placed in the entrance of the building, providing useful info to students and teachers about the state of the laboratory and also studied the possible ways to further provide quick and easy means to help students and teachers, including the viability analysis of an online support chat.

Index Terms—cluster, system administration, user support.

1 INTRODUCTION

OUR small team of 6 elements at DEI is responsible for the over 90 Personal Computers (PCs) in the Computer Science (CS) building and for the cluster running on these machines.

It is our team's responsibility to satisfy a set of requirements at the CS building. In addition to our responsibility of maintaining the network and PCs, we also provide a set of services of practical utility for students and teachers of CS.

1.1 Networking

All of the building's network infrastructure is managed by us, therefore we are responsible for keeping the routers, switches and cables properly set up and in good conditions.

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1.2 PCs

We are responsible for acquiring and maintaining the PCs, so we are responsible for diagnosing any PC which has an issue and taking the proper course of action.

1.3 Software

All of the software is chosen and set up by our team. We try to keep the widest possible collection needed for the CS courses while avoiding conflicts. Sometimes, this requires ingenious ideas such as using Virtual Machines (VMs).

1.4 Cluster

We are the maintainers of DEI's High Performance Computing (HPC) and High Throughput Computing (HTC) cluster, which offers map-reduce software (Hadoop [1]) and more general distributed computation (OpenMPI [2] and HTCondor [3]) services.

1.5 User Support

We provide users with relevant information through our website, including relevant news,

(1.0) Excellent	ACTIVITY					DOCUMENT						
	Objectives x2	Options x1	Execution x4	S+C x1	SCORE	Structure x0.25	Ortogr. x0.25	Gramm. x0,.25	Format x0.25	Title x0.5	Filename x0.5	SCORE
(0.8) Very Good	2	1	3.6	0.8	7.4	0.25	0.2	0.2	0.25	0.5	0.5	1.9

the status of the laboratories, a list of software and answers to frequently asked questions.

We also provide direct support through our web forum, email service, and opening hours.

2 TEAM

Our group from Independent Studies is the part of the team responsible for the Linux side of the software. We are responsible for maintaining the Linux distribution in the PCs **up to date** and complete with a selection of adequate software for the courses and useful for the students in general.

In addition to these responsibilities we have a small set of projects of smaller dimension.

mbdated

2.1 Dashboard

One of the projects started this semester was the development of an informative dashboard, for displaying at the building entrance. As students, we think **a lot** of information about the laboratories and classes is not easily accessible when in a hurry and we decided to develop a convenient way of accessing it.

An evaluation of the students' interests when accessing the building was done, and ways to present the information were studied. After reaching a consensus, the result is a web application with information about the number of free PCs in each laboratory, the classes which might be of interest to CS students, and news about the CS building and from DEI. This application will later be deployed as an integrated solution with an **LCD** display and a Raspberry Pi driving it. A mobile-ready version of this application has been developed and is in the process of being published.

This project required negotiations with DEI for acquiring the needed hardware and coordination for news publishing, as well as some light market research in regards to real students' needs (using Agile Development techniques). At the moment of writing of this report, the project **has been done** and its results are waiting to go into production.

in wip/d / in finished

2.2 Documentation

Upon our initial arrival at the team, there were already several projects ongoing from former members. Many times these were underdocumented and often **times even not** reproducible.

We spent and continue spending a considerable amount of time documenting best practices, implementations, and shortfalls.

We also dedicated some time into guaranteeing that the Linux installation is reproducible, thus ensuring that a new installation image can be created any time to place in the laboratories.

This effort involved converting all configurations into a custom language that can be applied post-deploy with Puppet [4], as well as scripting and automating most of the deploy stages before Puppet.

2.3 User Awareness

We have been in a constant effort to improve user awareness of DEI's role in their education and providing an always improving service for students and teachers.

To do so, we started with a renewed image for our team, to drive up awareness of it among students using the laboratories. We started providing informative signs at classroom entrances with information on the available resources, have promoted community contributions through a design contest and collaborated with Núcleo Estudantil de Informática do Instituto Superior Técnico (NEIIST) and Direção de Serviços de Informática (DSI) in lectures about provided services.

The contest requested the students to design wallpapers for the PCs in the laboratories. All the wallpapers submitted would be made available for the students to choose from and one would be made the default for the login screen. As a result, the laboratories now feature new wallpapers and this allowed students to contribute and understand they too can make a difference.

The lectures given by our team to the student community helped its image, as well as passing on technical knowledge about services provided to students.

2.4 User Support

One of the crucial things developed for user support was written guidelines on how to help students and teachers when they ask for help. This allowed us to know how to reply for several use cases and how to guide users when troubleshooting issues.

We have also started the development of an online support chat. We started by looking at the available solutions and considered the possible ways to implement them.

After we agreed on one specific implementation, we are now considering how to prepare it so that users can benefit from it. This involves preparing public chatrooms for support and private chatrooms for discussing possible ways to help a given user.

The next stage is opening this reference implementation to test and, if successful, promote it among students.

3 CONCLUSION

When we joined the team, it was already facing a shifting process: documentation was starting being developed and there was an effort to open up the team to the people surrounding it. Our coordinator, Samuel Bernardo, was responsible for this shift in culture and strived to make us part of it. As a result, we are now more organized, more efficient, and more open to the students around us. We have started new projects for their benefit and improved our image among them.

ACKNOWLEDGMENTS

We would like to thank DEI and Professor David Martins de Matos for making the existence of our team possible, helping with all the associated bureaucracy and guiding us on the development of our services and infrastructure.

We would also like to thank the rest of our team for the technical guidance provided throughout our time here. And especially to Samuel Bernardo, our team coordinator, for the insights on the way companies and the Faculty Administration work and how decisions are made in the real world, involving all the stakeholders.

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- [2] "OpenMPI." [Online]. Available: <http://www.open-mpi.org/>
- [3] "HTCondor." [Online]. Available: <http://research.cs.wisc.edu/htcondor/>
- [4] "Puppet." [Online]. Available: <http://puppetlabs.com/>



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In this type of document (technical), The Conclusion should start with a SUMMARY of the subject addressed and then should highlight the results.



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APPENDIX

STATEMENTS OF EXECUTION



DIREÇÃO DE RECURSOS HUMANOS

DECLARAÇÃO

---- Nos termos do disposto nos nºs 4 e 5 do artigo 7.º da Lei n.º 40/2004, de 18 de agosto, alterada e republicada pelo Decreto-Lei n.º 202/2012 de 27 de agosto, diploma que aprova o Estatuto do Bolseiro de Investigação, e no Regulamento de Bolsas de Investigação do Instituto Superior Técnico, aprovado a 19 de outubro de 2011 pela Fundação para a Ciência e a Tecnologia, I. P, declara-se que, **José Pedro de Almeida Arvela**, é detentor(a) neste Instituto de uma bolsa de longa duração, na modalidade de BIIC, no âmbito do projecto e pelo período infra mencionado:-

Projeto / Centro Custo	Data – Início	Data - Fim	Professor Orientador
CG	01-09-2014	31-08-2015	Prof. David Manuel Martins de Matos

---- Mais se declara que o referido bolseiro auferiu, a quantia mensal de € 385 (trezentos e oitenta e cinco euros). -----

---- Instituto Superior Técnico, 20 de novembro de 2014. -----

 Direção de Recursos Humanos
Diretor



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Projeto / Centro Custo	Data – Início	Data - Fim	Professor Orientador
CG	01-11-2013	31-10-2015	Prof. David Manuel Martins de Matos

---- Mais se declara que o referido bolsheiro aufera, a quantia mensal de € 385 (trezentos e oitenta e cinco euros). -----

---- Instituto Superior Técnico, 08 de dezembro de 2014. -----

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