Google Cloud Platform

Tuesday 9th April, 2019 - 19:33

Motivated Student
University of Luxembourg
Email: motivated.student@uni.lu

Motivated Tutor
University of Luxembourg
Email: motivated.tutor@uni.lu

Abstract

This document is a template for the scientific and technical (S&T for short) report that is to be delivered by any BiCS student at the end of each Bachelor Semester Project (BSP). The Latex source files are available at: ***https://github.com/nicolasguelfi/lu.uni.course.bics.global***

This template is to be used using the Latex document preparation system or using any document preparation system. The whole document should be in between 6000 to 8000 words (excluding the annexes) and the proportions must be preserved. The other documents to be delivered (summaries, ...) should have their format adapted from this template.

1. Introduction (± 5% total words)

This paper presents the bachelor semester project made by Motivated Student together with Motivated Tutor as his motivated tutor. It presents the scientific and technical dimensions of the work done. All the words written here have been newly created by the authors and if some sequence of words or any graphic information created by others are included then it is explicitly indicated the original reference to the work reused.

This report separates explicitly the scientific work from the technical one. In deed each BSP must cover those two dimensions with a constrained balance (cf. [**?**]). Thus it is up to the Motivated Tutor and Motivated Student to ensure that the deliverables belonging to each dimension are clearly stated. As an example, a project whose title would be "A multi-user game for multi-touch devices" could define as scientific [**?**] deliverables the following ones:

- Study of concurrency models and their implementation
- Study of ergonomics in human-computer interaction

The length of the report should be from 6000 to 8000 words excluding images and annexes.

2. Project description (± 10% total words)

2.1. Domains

There are two big domains that are being tackled in this BSP. On the one hand we have virtualization and on the other hand we have cloud computing along side its service models.

2.1.1. Scientific. The different service models are Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). The three service models are briefly explained in the following.

IaaS We are provided with the necessary infrastructure to run a virtual machine and the rest is up to us.

PaaS We get the necessary resource as well as an OS installed with some basic software. We can use the provided platform and modify it as we please. However we are not able to touch the underlying virtual hardware.

SaaS We are provided with everything needed to run a specific software. We are only able to access the software and none of its underlying components, like the OS or the hardware.

2.1.2. Technical. Virtualization allows us to move from physical mediums to virtual ones without really losing anything. The only major difference is that now we do not manipulate the hardware directly but instead manipulate the virtual hardware through specific software. This allows for great flexibility in a lot of ways.

Cloud computing brings the domain of virtualization to yet another level. We are still manipulating a virtual medium, but the virtual machine does not run locally on our physical machines. Instead these machines run on some servers and we can controll them through a remote connection. This leads us to the various service models employed by the cloud.

2.2. Targeted Deliverables

2.2.1. Scientific deliverables. We want to create a tutorial that accompanies our technical solution. The tutorial is meant to guide the DevOps engineer and help him understand and use our solution.

2.2.2. Technical deliverables. We have to consider two types of users: the DevOps engineer and the Excalibur user.

As for the DevOps engineer, the objective of this BSP is to have a fully automated solution that handles the virtual machine creation on the Google Cloud Platform. Added to this, all the necessary tools should be downloaded such that we can put and Excalibur Environment on it. He also needs to ensure access to the new virtual machine for the Excalibur user.

As for the Excalibur user, we want him to simply be able to connect to the virtual machine created in the cloud and use the Excalibur Environment. The end user should not worry about anything related to the virtual machine's creation and setup.

3. Background (± 10% total words)

Describe in this section the main knowledge supposed to be formerly known by you and that is useful to remind in order to understand the remaining parts of your report. Do not include presentation of technologies or scientific concepts that belong to an objective of your BSP since it must be described in the section **??**. Thus all the content of this section is not considered as a deliverable

3.1. Scientific background

Virtual machines constitute the big scientific aspect to be familiar with for this BSP. They were already briefly explained before in section 2.1.

Also the concept of provisioning should not be foreign. In essence, provisioning allows us to put files and packages as well as execute scripts onto a virtual machine without accessing it directly. We can write scripts, or in our case configuration files, that will then access the machine and accomplish all the specified tasks.

3.2. Technical background

The technical aspect to be familiar with for this BSP were how provisioning works with Ansible. This is important because we are trying to reuse the work done in the previous BSP and get it to work on our virtual machines in the cloud.

Ansible is a tool that allows to write configuration files that basically specify what a machine should be provisioned with. It allows for great flexibility and keeps the focus on easy to read and write code.

4. A Scientific Deliverable 1

For each scientific deliverable targeted in section 2.2 provide a full section with all the subsections described below.

4.1. Requirements (± 15% of section's words)

Describe here all the properties that characterize the deliverables you produced. It should describe, for each main deliverable, what are the expected functional and non functional properties of the deliverables, who are the actors exploiting the deliverables. It is expected that you have at least one scientific deliverable (e.g. "Scientific presentation of the Python programming language", "State of the art on quality models for human computer interaction", ...) and one technical deliverable (e.g. "BSProSoft - A python/django website for IT job offers retrieval and analysis", ...).

4.2. Design (± 30% of section's words)

Provide the necessary and most useful explanations on how those deliverables have been produced.

4.3. Production (± 40% of section's words)

Provide descriptions of the deliverables concrete production. It must present part of the deliverable (e.g. source code extracts, scientific work extracts, ...) to illustrate and explain its actual production.

4.4. Assessment (± 15% of section's words)

Provide any objective elements to assess that your deliverables do or do not satisfy the requirements described above.

5. A Technical Deliverable 1

For each technical deliverable targeted in section 2.2 provide a full section with all the subsections described below. The cumulative volume of all deliverable sections represents 75% of the paper's volume in words. Volumes below are indicated relative the the section.

5.1. Requirements (± 15% of section's words)

5.2. Design (± 30% of section's words)

5.3. Production (± 40% of section's words)

5.4. Assessment (± 15% of section's words)

Acknowledgment

The authors would like to thank the BiCS management and education team for the amazing work done.

6. Conclusion

The conclusion goes here.

References

[BiCS(2018a)] BiCS Bachelor Semester Project Report Template. https://github.com/nicolasguelfi/lu.uni.course.bics.global University of Luxembourg, BiCS - Bachelor in Computer Science (2017).

7. Appendix

All images and additional material go there.