



D16. SYSTEM MAINTENANCE PLAN

Report	WP6. Dissemination and design of system maintenance plan
Version	3.0
Status	Final
Date of issue	
Dissemination level	Public
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Co-funded by the
Erasmus+ Programme
of the European Union

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Project Number:59184-EPP-1-2017-1-ES-EPPKA2-SSA-N



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1 INTRODUCTION

With regard to the maintenance system of the project and more specifically of the resulting software tool, DETECTA, which functions as a dynamic observatory of the construction sector, it will be the coordinating entity FORTEC that will take on this task.

The main reasons are as follows:

- FORTEC has actively participated in the technological development phase
- During the production of the software all the development has been hosted on a FORTEC server
- FORTEC, together with ITAINNOVA, are the entities with the most technological profile to deal with possible incidents that may arise because of its use.

This also means that FORTEC assumes the costs derived from this maintenance.

Although FORTEC will maintain the system, the rest of the partners will add direct access to the tool from their web portals to provide a service to their visitors and end users.

2 RECURSOS HUMANOS

FORTEC dispone de un departamento de innovación tecnológica con cualificación suficiente para efectuar la administración de una herramienta como DETECTA. En concreto, la persona encargada del mantenimiento del sistema será D. Marcos Miranda, cuyo perfil curricular es el siguiente:

DATOS DEL TRABAJADOR	
Nombre: Marcos Iván Miranda García Fecha incorporación: 08 / Abril / 2019	Puesto: Administrador de Sistemas. Desarrollador PHP Nivel de estudios: Ingeniería en Computación, graduado con mención honorífica de la Universidad Nacional de Ingeniería en Managua, Nicaragua. (2011- 2015)

CURSOS REALIZADOS

Nombre del curso	Centro académico	Duración	Fecha
Diseño de páginas web	UNI	3 meses	2011
Comienzos en la programación de videojuegos con C#	Coursera	4 meses	2013
Programación para todos (Python)	Coursera	2 meses	2013
Programación de Aplicaciones Móviles para Sistemas Portátiles Android: Parte 1	Coursera	3 meses	2014
Desarrollo de Videojuegos en Unity: Una Introducción	Coursera	4 meses	2015

TECNOLOGÍAS QUE DOMINA

Programación

- Visual Basic .NET
- C
- C#
- XNA / MonoGame
- Python
- Flask
- Java
- libGDX

Diseño y desarrollo web

- HTML5 & CSS3
- SASS / SCSS
- Bootstrap



- PHP
- CodeIgniter
- JavaScript
- jQuery

Aplicaciones móviles

- Android (Java, Kotlin)

Manejo de bases de datos

- Transact SQL
- MySQL
- SQL Server
- SQLite

Manejo de sistemas Linux

- Arch
- Ubuntu

EXPERIENCIA PROFESIONAL		
Empresa	Puesto	Tiempo de permanencia
UNI – IES	Desarrollador Web	2 años
A MAS TRES, S.A.	Desarrollador Web. Administrador de sistemas	13 meses
FUNDACIÓN UNO	Teacher Assistant	11 meses
FORMACIÓN Y TECNOLOGÍA, S.L.	Administrador de Sistemas. Desarrollador PHP	Desde 08 / Abril / 2019



3 CARACTERÍSTICAS DEL HOSPEDAJE

The hosting characteristics of the DETECTA tool are as follows:

Amazon EC2 Virtual Instance

- OS: Ubuntu 20.04 LTS, x86-64
- 2 CPU cores
- 8 GB RAM
- 50 GB of disk space

Because the containers that make the app work were generated for a specific Docker version, the Docker packages in this system are frozen and will not be updated. System updates should be done with caution.

Amazon updates the Linux kernel in their running instances automatically, leaving the packages of the previous versions behind. These unused kernel packages should be removed occasionally to reclaim disk space.

4 COPIA DE SEGURIDAD

Source control is important for maintaining a single source of truth for development teams. Plus, using it helps facilitate collaboration and accelerates release velocity.

Regarding source control in DETECTA, Github has been used. Github is based on Git. Git is an open-source version control system that was started by Linus Torvalds—the same person who created Linux. Git is similar to other version control systems like Subversion, CVS, and Mercurial to name a few. When developers create something (an app, for example), they make constant changes to the code, releasing new versions up to and after the first official (non-beta) release. Version control systems keep these revisions straight, storing the modifications in a central repository. This allows developers to easily collaborate, as they can download a new version of the software, make changes, and upload the newest revision. Every developer can see these new changes, download them, and contribute. Git is the preferred version control system of most developers, since it has multiple advantages over the other systems available. It stores file changes more efficiently and ensures file integrity better.

Git is a command-line tool, but the center around which all things involving Git revolve is the hub—GitHub.com—where developers store their projects and network.

Some relevant concepts of Github are:



- A repository (usually abbreviated to “repo”) is a location where all the files for a particular project are stored. Each project has its own repo, and you can access it with a unique URL.

- “Forking” is when you create a new project based off of another project that already exists. This is an amazing feature that vastly encourages the further development of programs and other projects. If you find a project on GitHub that you’d like to contribute to, you can fork the repo, make the changes you’d like, and release the revised project as a new repo. If the original repository that you forked to create your new project gets updated, you can easily add those updates to your current fork.

- Pull Requests: Once a developer has forked a repository, made a great revision to the project, and want it to be recognized by the original developers—maybe even included in the official project/repository. You can do so by creating a pull request. The authors of the original repository can see your work, and then choose whether or not to accept it into the official project. Whenever you issue a pull request, GitHub provides a perfect medium for you and the main project’s maintainer to communicate.

- Change logs: When multiple people collaborate on a project, it’s hard to keep track revisions—who changed what, when, and where those files are stored. GitHub takes care of this problem by keeping track of all the changes that have been pushed to the repository.

Within DETECTA project several branches were created, accordingly to the deployment level (next figure).

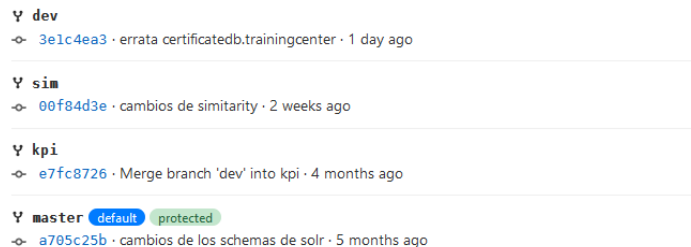


Figure manager of branches in DETECTA Github

That’s because it allows multiple developers to work on the same codebase. They can commit and merge code without conflicts. And they can even make edits to shared code, without unknowingly overwriting each other’s work.Regarding deployment, storage and computing servers (hardware), two environments has been developed to deploy the DETECTA tool iteratively:

- Development (pre-production) environment: It was deployed in “Super Computing Center of Aragon” (CESAR), and used during the development of the system.



- Production environment: It was deployed in an infrastructure compatible with the national security scheme of a cloud service provider, as is the case of the Amazon cloud services. In this way, quality is guaranteed and the maintenance infrastructure reduced.

Containers give developers the ability to create predictable environments that are isolated from other applications. Containers can also include software dependencies needed by the application, such as specific versions of programming language runtimes and other software libraries.

Developing apps today requires so much more than writing code. Multiple languages, frameworks, architectures, and discontinuous interfaces between tools for each lifecycle stage creates enormous complexity. We use Docker to simplify, while giving developers the freedom to innovate with their choice of tools, application stacks, and deployment environments for each project.

Based on this work done, it makes possible to deploy and maintain DETECTA tool in a controlled way, as every component is storage in a repository and there is a structured way to deploy all the components.

