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CENTER OF EXCELLENCE



A CyberCrime Center of Excellence for Training, Research and
Education in Greece

Deliverable D1.4: Web Site

Abstract: This document discusses the website of the Greek Cybercrime Center (GCC). First, we focus on its different content sections, the integration of social networking features and the content update mechanism. Then we provide a short overview of the platform and methods used for its development. Finally, we highlight possible future enhancements.

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SAFENET	Hellenic Self Regulatory Body for Internet Content	Principal Contractor	Greece
KEMEA	Center for Security Studies	Principal Contractor	Greece
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This document details the creation of the public GCC website which is the main objective of Task WP1.3 of the project. The GCC website can be accessed from <http://www.cybercc.gr/>.

This website is the third task of the *Project Management Workpackage* (WP1) and has the objective to maximize the impact of the project. Its main goal is to make all project activities and results visible and accessible to the Greek stakeholders community. In addition, we also aim to make GCC contributions accessible to international stakeholders. In order to achieve these goals, the site is *bilingual*, with content delivered both in Greek and English. Additionally, with the integration of *social networking features* to the website we hope to be able to extend our reach to the wider cyber-forensics community and general public as well.

More specifically, with the public GCC website we aim to:

- create a major on-line dissemination mechanism for the project.
- inform and mobilize the Greek constituency in the area of cybercrime investigation.
- make available the courses and training material created by the project.
- *spread the excellence* between the Greek Cybercrime Center and similar transnational projects, such as **2CENTRE**¹ and **B-CCENTRE**².

¹2CENTRE is the European Cybercrime Centres of Excellence Network: <http://www.2centre.eu/>

²B-CCENTRE is the Belgian Cybercrime Centre of Excellence for Training, Research & Education: <http://www.b-ccentre.be/>

1.1 Document outline

In the following Chapters, we will describe the GCC website as it was at the time of delivery of this document. In Chapter 2 (page 11) we initially present the content and features of the GCC website and then describe how the website can be updated using a web browser.

Next, in Chapter 3 (page 27) we describe the tools used to create the website and why we chose them. We also briefly present the principles that the site is based on and the *web standards* that the GCC website adheres to. Closing the chapter we present the hardware and network infrastructure we use to run the site.

Finally, in Chapter 4 (page 31) we summarize the website setup and outline possible future additions and enhancements. These are content and features that are can be added at any time through the course of the project to help the website to better serve its purpose.

2.1 GCC website timeline

2.1.1 Logo and domain

In the e-mail discussion preceding the kick-off project meeting, it was decided to use the domain **cybercc.gr** for the activities of the project. Also, the consortium had chosen the project logo from several designs drafted by Michalis Polychronakis of FORTH. The selected logo can be seen in Figure 2.1. The main arguments in favor of this design were its *minimalistic design* and the overall *clear-cut rendering* which make it suitable for all envisioned uses (website, printed material, t-shirts etc.).



Figure 2.1: The official GCC logo.

At the time of the meeting a website was already responding on <http://www.cybercc.gr/>, displaying a placeholder page (Figure 2.2) with the project logo. The placeholder page was displayed through the development and setup of the website.

CHAPTER 2. WEBSITE CONTENTS AND UPDATE



Figure 2.2: The GCC placeholder page.

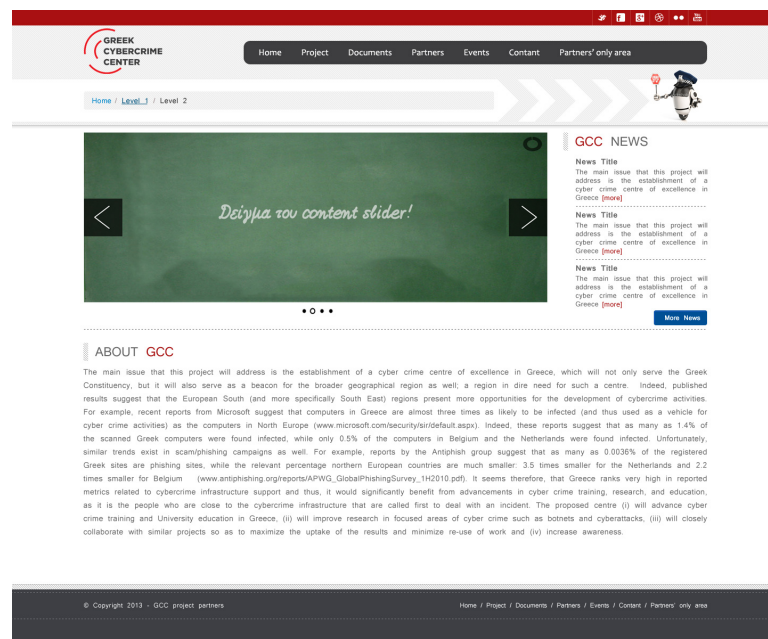


Figure 2.3: GCC draft website template.

2.1.2 Template development

At the project kick-off meeting, on February 1, 2013, a draft design for the template of the website was presented (see Figure 2.3). The development of the template had been commissioned by FORTH to an external company. It was decided to request two additional templates, for a total of three to select from.

2.1.3 Website setup

The first version of the template chosen by the consortium was delivered on March 11. The consortium provided some feedback to the designers while at the same time worked on setting up (see Section 3.2) and integrating the template with Django-CMS. The fact that the site will be bilingual (English/Greek) made the setup process slightly more complicated than what was initially expected. The GCC website was finally launched on **April 8, 2013**.

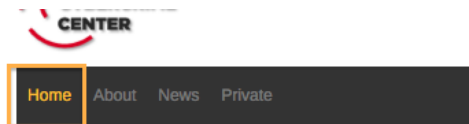
2.2 Public website sections

In this section we will briefly present the current sections of the GCC website. At this point of time, the main goal of the website is to provide information on the Greek Cybercrime Center and its goals while facilitating interested parties to get in touch with the project.

Of course, the website will be a work-in-progress throughout the duration of the project. We will later be adding information about GCC-organised events, as well as talks and public training courses.

2.2.1 Home Section

The primary goal of the *Home* section is to provide a quick overview of the Greek Cybercrime Center. Since this is the default landing page of the website, it also provides the latest news of the project.



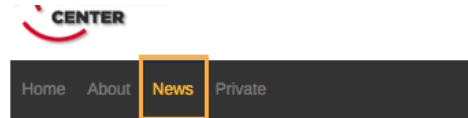
A screenshot of the English and Greek versions of the *Home* section can be seen on Figure 2.4¹. We can see that *Home* section uses a two-column layout. The larger left part is used to provide the overview of the project. The right part of the layout is used to show the latest GCC news. The displayed news are obtained real-time from the *Greek Cybercrime Center Twitter feed*.

¹For the following sections we will be displaying only screenshots of the English version of the sections.

More information on the Twitter integration to the website can be found later in Section 2.4.

2.2.2 News Section

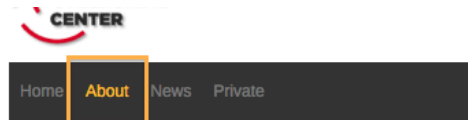
The *News* section (Figure 2.5) displays an extended list of news item compared to *Home section list*. Again, the items are pulled in real-time from the Greek Cybercrime Center*Twitter feed*. Any announcements about project events, talks, training and university courses will be displayed here.



Using Twitter for news announcements is very convenient because of the low startup overhead of the solution. However, it also places stringent limits to the length of our announcements². To overcome this limitation, we plan to eventually replace the *News* section with a blog-like news solution, as described in Section 4.1. Twitter feed however will remain on display at *Home section*.

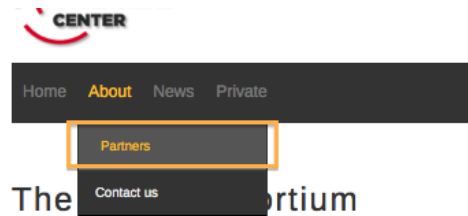
2.2.3 About Section

The *About* section (Figure 2.6) provides general information about the Greek Cybercrime Center. It contains the objectives of the project as well as a brief summary of our work plan.



2.2.4 Partners Section

The *Partners* page (Figure 2.7) presents the profiles of the GCC consortium members, aiming to present them at website visitors. For each partner a general organization overview is provided which is followed by details on their GCC-related activities. Next to each partner's profile their logo is displayed.



2.2.5 Contact us Section

²Tweets may contain up to 140 characters.

2.2. PUBLIC WEBSITE SECTIONS



Figure 2.4: Website home page - English and Greek versions.

CHAPTER 2. WEBSITE CONTENTS AND UPDATE

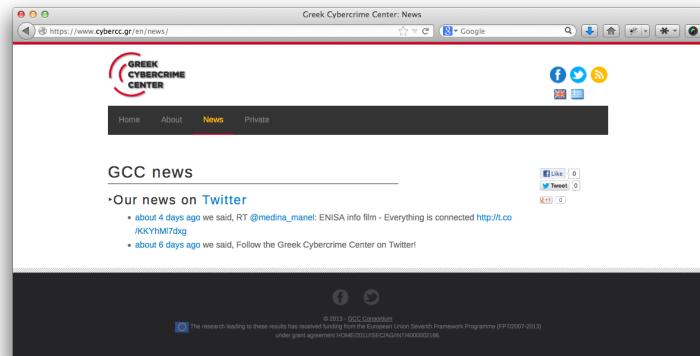


Figure 2.5: News section.

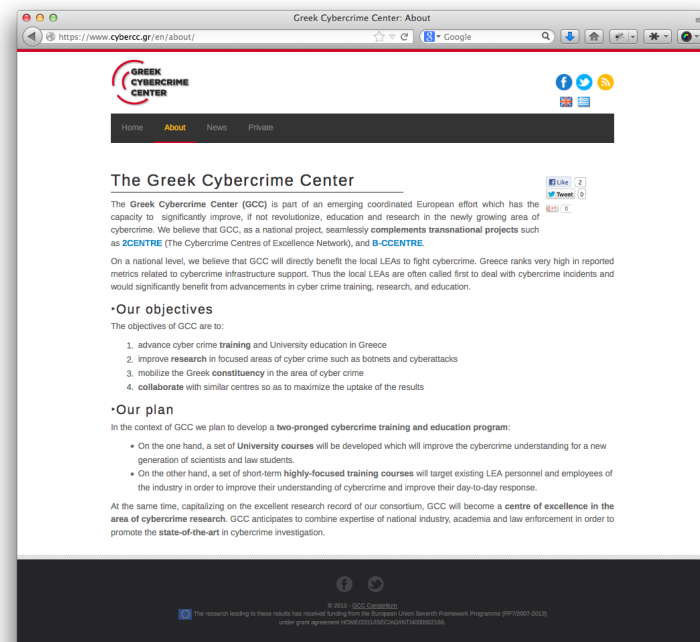


Figure 2.6: About section.

2.2. PUBLIC WEBSITE SECTIONS

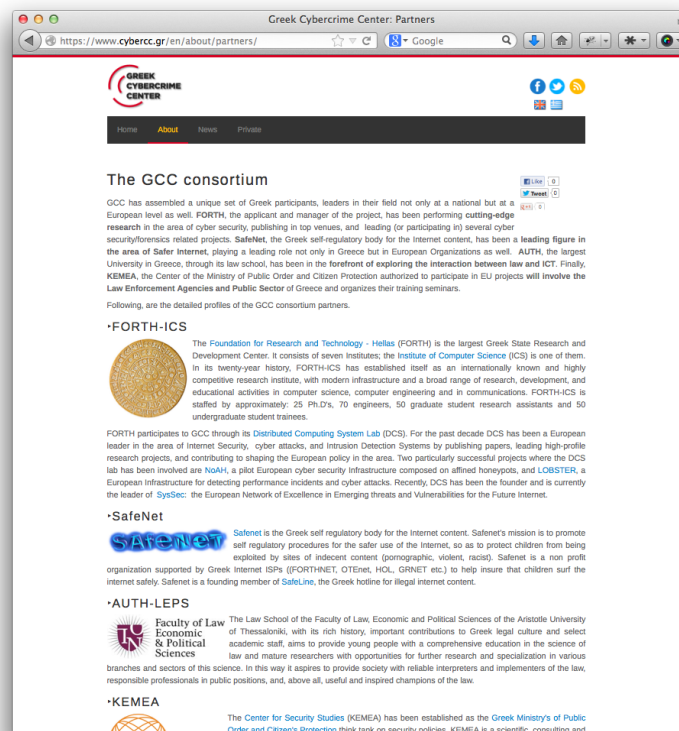


Figure 2.7: Partners section.

The *Contact us* page (Figure 2.8) contains a contact form allowing visitors to contact project consortium us and submit comments, questions or suggestions on Greek Cybercrime Center. The *email* address of the visitor is required in order to send feedback.

We opted for a contact form, instead of publishing a contact email address, in order to avoid having our email address harvested and spammed through the course of the project. As an additional anti-spam measure, the form is protected by a CAPTCHA³.

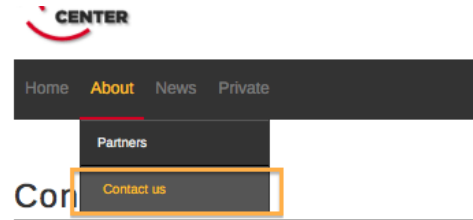
A screenshot of the Greek Cybercrime Center 'Contact us' page. The page has a white background with a dark grey header. The header contains the Greek Cybercrime Center logo and navigation links: 'Home', 'About', 'News', 'Private'. Below the header, the page title 'Contact us' is displayed. The main content area contains a form with the following fields: 'Your email address:', 'Subject:', and 'Enter your message below:'. Below the message field is a CAPTCHA challenge that asks the user to 'Please enter the two words on the image separated by a space:'. The CAPTCHA image shows the words 'results' and 'results' (partially obscured). A 'Send' button is located at the bottom of the form. The footer of the page contains social media icons and a small disclaimer.

Figure 2.8: GCC contact form.

2.3 Website *Private Area*

The private area of the website is intended as a platform that will help the partners synchronize their actions and collaborate.

³<http://en.wikipedia.org/wiki/CAPTCHA>

During the writing of the project proposal, the consortium collaborated using the *Subversion version control system* [8]. Subversion (SVN) proved very convenient for making concurrent edits to consortium shared files. Additionally, many partners already had login credentials for the shared SVN repository. For these reasons and in order to avoid fragmentation it was decided to stick with the exclusive use of the *Greek Cybercrime Center SVN Repository* as a collaboration platform.

However, because a Subversion client may not always be available, it was decided to integrate access to the repository in the Greek Cybercrime Center website. The *Private Area* of the Greek Cybercrime Center website is the web front-end to the *Greek Cybercrime Center SVN Repository* and is shown in Figure 2.9.

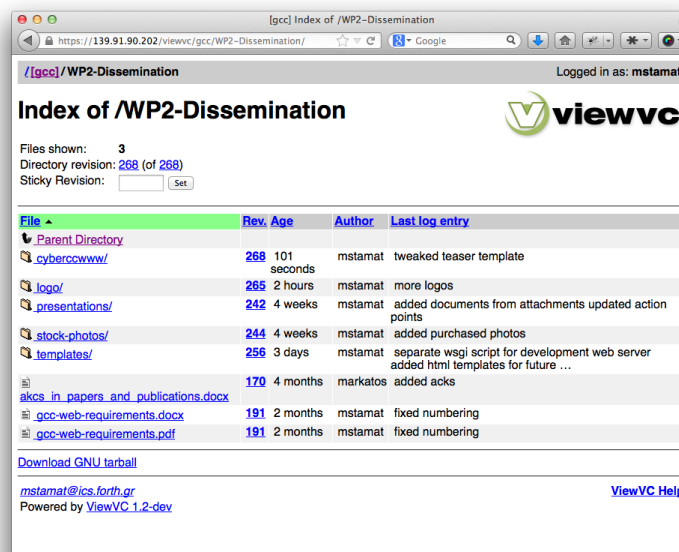


Figure 2.9: Private Area.

The *Private Area* gives the partners read-only access to all revisions of the project files. Most of the Subversion read-only operations, like showing the differences between text files (*svn diff*), showing who contributed each line of a text file (*svn blame*) etc, are also supported. It also provides the capability to collectively download all the files of a directory in the *GNU tar* archive format.

2.4 Integration with Social Networks

Social networks[17] can be seen as electronic *aggregators* of someone's personal interests and provide a fairly easy way to subscribe/unsubscribe to various information sources. For this reason, social networking plays an increasingly important role in the dissemination of all kind of information. On the other hand, the traditional mailing lists are much more cumbersome to subscribe/unsubscribe and have been regularly associated with spam. As a result, in the recent years many people have become quite wary towards joining mailing lists, e.g., to receive Greek Cybercrime Center news, while on the other hand they are quite comfortable with using a social network to receive exactly the same news.

Additionally, notifications received through social networks could be seen as the electronic equivalent of *word of mouth*. E.g., if a user receives a notification that a colleague of his “likes” GCC, he will probably consider finding out more about the project. This makes social networks a notably good medium for the dissemination of information.

For these reasons, the GCC consortium decided to explore the use of social networking as a dissemination medium complementary to its *dissemination mailing list*. Towards this ends, a GCC presence was established in two of the most popular social networks: *Facebook* and *Twitter*.

2.4.1 Twitter presence

Twitter[15] is social networking microblog that enables users to communicate with short messages called *tweets*. Users are able to “follow” other users which results in the tweets of the followed user being displayed in their personal message feed.

The Twitter profile of the Greek Cybercrime Center⁴ can be seen on Figure 2.10. It has been integrated to the website in the form of the *news feed* of the *Home* section (Figure 2.4). Twitter is also used to produce the *RSS feed* of the website. RSS feeds can be used to deliver timely information to interested parties and let them continue using the RSS aggregator of their choice.

2.4.2 Facebook presence

Facebook[4] is the most popular social network site and website. It was launched in February 2004. Facebook is much more complex than Twitter as it works as a social platform that allows many independently developed applications to run. Its richer content makes it appealing to a much larger audience. As a result, by mid 2012 Facebook had more than *1 billion active users*.

⁴ Our Twitter profile can be accessed on <http://twitter.com/CyberccGR>

2.4. INTEGRATION WITH SOCIAL NETWORKS



Figure 2.10: GCC Twitter page.



Figure 2.11: GCC Facebook page.

The much larger potential audience in Facebook led to the consortium's decision to also establish a Greek Cybercrime Center presence there. As a result, a Greek Cybercrime Center page was created on Facebook⁵ which can be seen on Figure 2.11.

2.4.3 Social icons

To make easy for visitors to “socially” interact with us, we have added social networking icons to all the pages of the website. The location of these icons can be seen in Figure 2.12. The top and bottom icons lead to our our social media pages and RSS feed. More important, the icons at the beginning of each page's content enable visitors to easily share the content with their social network contacts.

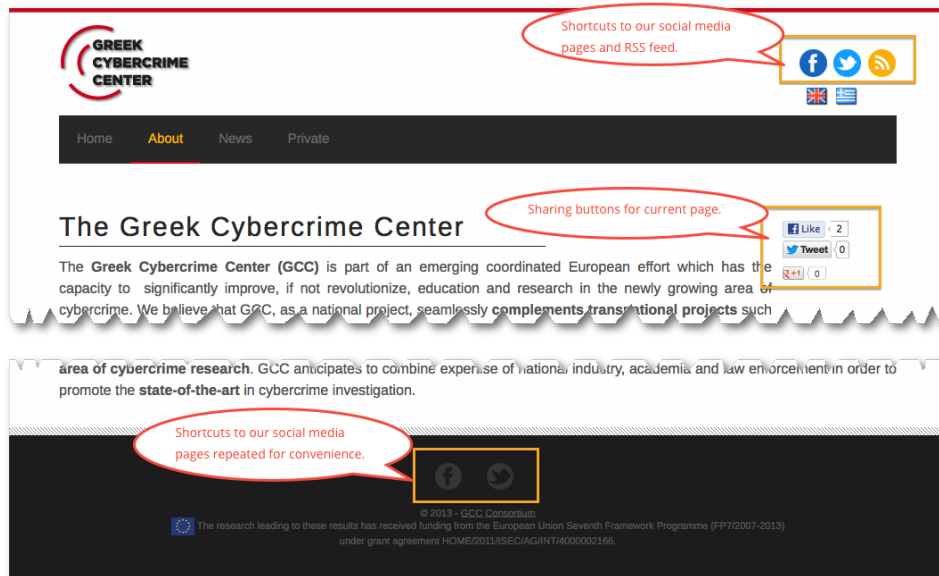


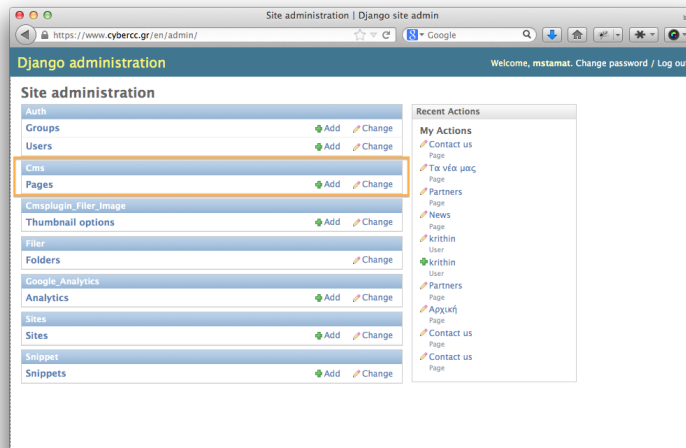
Figure 2.12: Social networking icons.

2.5 Updating the Website

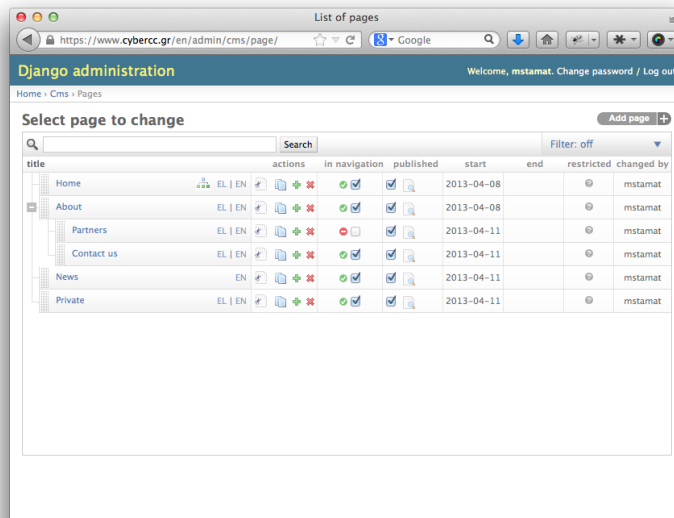
The contents of the Greek Cybercrime Center website can be easily updated using a web browser. This feature is provided by the CMS we use. After successful authentication, the website editor is presented with the *Site Administration Panel* shown in Figure 2.13(a). Through this panel all of the website's modules can be configured.

⁵ Our Facebook page can be accessed on <http://www.facebook.com/CyberccGR>

2.5. UPDATING THE WEBSITE



(a) Site administration panel. Highlighted is the section of the CMS module, which is used to edit content.



(b) Page hierarchy panel. The pages can be rearranged by dragging them and dropping them on their new location in the hierarchy tree.

Figure 2.13: Updating the Greek Cybercrime Center website

The contents of the site are updated through the *CMS module* which appears highlighted. Following the Pages link, the *page hierarchy panel* (shown in Figure 2.13(b)) is displayed. The panel allows the website editor to restructure the website menu by using *drag & drop* on the items. Additionally with a single-click the editor may hide a page from the navigation menu or take it offline.

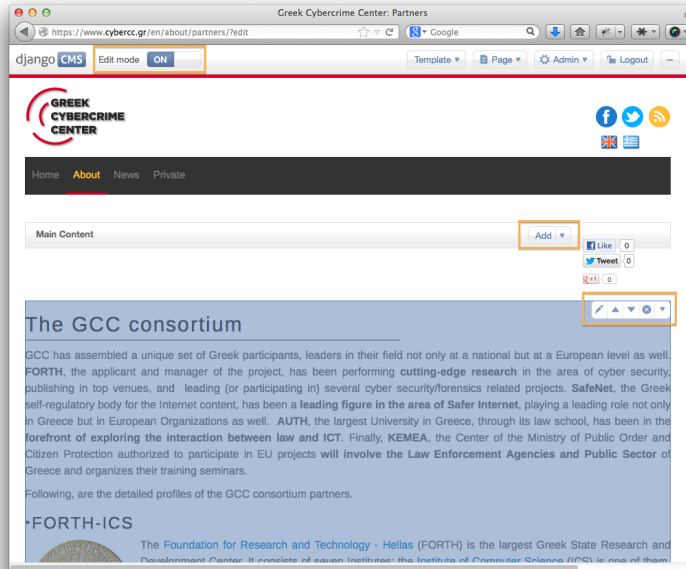
While it is possible to edit the content of a page through the admin interface we presented, it is usually more convenient to update it through the front-end editor of Django-CMS. The front-end editor feature is automatically enabled when visiting the website after having logged in the administrative interface. When it is enabled, a toolbar appears on the top of the page (see Figure 2.13(c)) which enables the user to go into edit mode.

In edit mode, the user is allowed to edit existing or add new *Content Plugins*. All content in Django-CMS has to be encapsulated in Content Plugins. Obviously, the most commonly used plugin is the *Text Plugin* which is used to edit and then display html formatted text. However more specialized plugins exist for interfacing with specific data sources (e.g. Twitter). In figure Figure 2.13(c) we have highlighted the buttons used to go into edit mode, to add new Content Plugins and to edit an existing one.

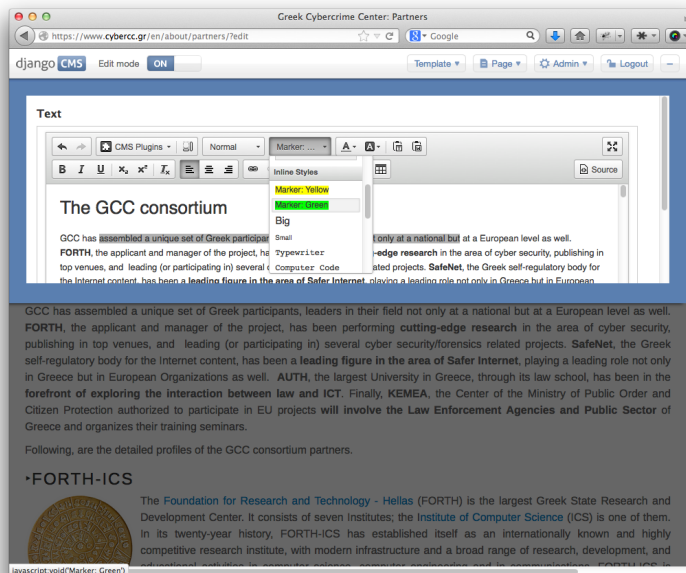
The editor used for editing the page text can be seen in Figure ???. As one can observe, it offers most of the formatting options that can be found in a full-blown word processor. Still, it encourages semantic-based html formatting. I.e. the contents are marked according to their semantics on the page and their final appearance is determined by the CSS[2] stylesheet used.

From its day-to-day use, we have found the website update mechanism very convenient and easy to use. Currently, the content of the website is updated by FORTH. If the need arises, it would be straightforward for other partners to contribute with only minimal training (if any at all).

2.5. UPDATING THE WEBSITE



(c) Front-end page editor. The highlighted buttons are used respectively to turn on the edit mode, add a new plugin and edit an existing plugin.



(d) Editing contents of a *Text Plugin* through the graphical editor.

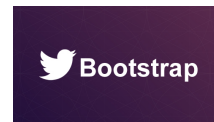
Figure 2.13: Updating the Greek Cybercrime Center website.

In this chapter we will describe the tools and methods we used to design and implement the GCC website. Additionally, we will give an overview of the hardware and network infrastructure we use to run the site.

3.1 Website Design

3.1.1 Grid based design

We wanted the GCC website to have a visual layout which is clean-cut while at the same time is easy to change in order to accommodate future needs. For this, we chose to have it designed and built using *Twitter Bootstrap* [12]. Twitter Bootstrap is a CSS[2] framework that allows the rapid prototyping of *grid-based website designs* while working equally well when integrated into a production system.



In grid based designs, the visual blocks that comprise the website (e.g., menus, text boxes, information boxes, ads etc) are not placed on arbitrary positions. Instead they are laid out on predefined rigid positions on a grid. This may sound restrictive but in practice the resulting design is much more efficient in communicating its contents to the visitor. This is because placing the visual blocks of the website on a grid results in *clear visual paths* and *visual structure and balance* on the design. Additionally, a grid based design also ensures consistency between the website pages and are much easier to update in order to accommodate any additional content.

Currently, Bootstrap it is the most popular project in GitHub[10]. It contains a set of stylesheets that provide basic style definitions for all key HTML components, as well as plenty of well designed visual elements (but-

tons etc.) to use in the website. More important, it makes very easy to position new elements on the website grid.

3.1.2 Browser Compatibility and Web Standards Compliance

The GCC website pages have been tested to comply with the *HTML5* standard [18], using the *W3C Markup Validator* [14].

The situation is more complicated with regards to *CSS* compliance. We have chosen to use *CSS3* [16] for the GCC website because it greatly simplifies the implementation of aesthetic elements such as rounded element corners, element shadows etc. Without *CSS3*, these elements have to be rendered as bitmap images and then included in the page, which degrades the semantic integrity of the produced *HTML* output.

However, the *CSS3* standard is currently a work in progress. So, while we have taken every care for our *CSS* code, it has been proved impossible to have *CSS3* code that both validates on the *W3C CSS Validator* [13] and works on all popular browsers. This made us take a more pragmatic approach and instead strive to have our pages render correctly with the latest versions of all popular web browsers.



3.2 Website hosting

3.2.1 Software stack

For serving the GCC website we use a *LAMP software stack*:

- Linux 2.6 [11] as the operating system
- Apache 2.2 [1] as the web server
- MySQL 5.0 [6] as the database backend
- Python 2.5 [7] for dynamically compiling the web pages

The later components of the stack have been distributed between two servers. The first server is dedicated to running the *MySQL server*, while the second runs the *Apache web server* and generates the dynamic pages using the python-based *Django* [9] web framework.

Django itself is a generic web framework that provides an *Object-Relational-Mapper* (ORM) that allows accessing objects stored in a relational database (in our case *MySQL*) as Python objects. For serving and managing our pages we use *Django-cms* [3] a Content Management System built on top



Figure 3.1: The GCC website software stack

of django. An overview of the basic Django-cms features has already been provided in Section 2.5.

The benefit of the Django/Django-cms combo is that they provide a clear, well documented Application Programming Interface. They are much more compact than other solutions which makes tweaking and extending them much easier. This could prove useful in case we need to extend the functionality of the GCC website beyond the basics. An additional benefit of this combo is the existing expertise of the consortium (specifically FORTH) on building and maintaining Django-cms sites.

Finally, we should mention that all the software components are regularly updated in order to be immune to known (and patched) security vulnerabilities.

3.2.2 Hardware and hosting

The GCC website is hosted by FORTH on their premises in Heraklion. The hosting server features two Intel Xeon dual-core CPUs running at 2.66GHz and a total memory of 4GB. It is connected to the Internet through FORTH's Gigabit connection to the GRNET¹ backbone. The server has two high-performance SAS disks (10k RPM) arranged as RAID-1 for fault-tolerance.

The server is protected by both software and hardware firewalls in order to minimize the risk from cyber-threats. As an additional security measure, the database server used by the GCC website is located on a separate host with even more restricted access rules. Both hosts are internally and externally monitored. Finally, remote backups through the *rsync* utility are performed for both on a daily basis.

It is also important that the hosts reside in a protected physical environment. They are located in one of FORTH's data-centres. For ensuring optimal operating environment, it is fitted with industrial-strength air conditioning with more than 240.000BTUs efficiency. In power emergencies, it

¹GRNET is the Greek NREN.

is supported by a UPS power supply and an external power generator which is engaged automatically on power failure. Additionally, the data-centre features an automatic carbon dioxide fire-extinguishing system.

Conclusions and future enhancements

4.1 Possible additions and enhancements

In this section, we will briefly outline additional functionality that could be added to the website in the future. In its current form, the GCC website is fully capable of providing all of the functionality envisioned for it in the project description.

However, the consortium will continue investigating future opportunities that would enhance the GCC website and help disseminate further project's goals. A few of the possible additions in content and enhancements in functionality are described in the following paragraphs.

- *Publications section*: The *Publications* section will be used to make available to the public the research papers published by the Greek Cybercrime Center. As the list of published documents will expand both in length (i.e. more conference papers) and in diversity (i.e. inclusion of deliverables) it is expected that more content will soon be added to this section.
- *Blog-like News page*: We have previously discussed in section (Figure 2.5 the limitations of using Twitter to post the news of the project online. For this reason, we plan to add a new blog-like news page to replace the existing Twitter-based one.

Content will be ordered descending by creation date. In addition, news will be indexed by *date* or by *tag*. Tags are keywords that are used to label and categorize the news posts. The visitor will be able to click on a tag and see all news that share that tag.

- *Photo gallery*: GCC, as a *Center of Excellence* project, is expected to organise several talks, seminars and other events through its course.

Merely listing these activities could leave the visitors of the GCC website rather unimpressed. An excellent way to communicate the “pulse” of these events to the website visitors would be to include a *photo gallery* of the “action” from each event.

Today, there are numerous options for adding this functionality to a website. Fortunately, there is This would be in contrast with the fervor that the consortium works to make these events happen. Fortunately, *Lightbox*[5] one of the most popular web photo gallery solutions already has support for integration with django-cms.

4.2 Conclusions

In this document, we discussed the GCC website. We provided a description of its section and content and outlined the *social networking* features we have integrated. Moreover, we showed the process of updating the website through a user-friendly *front-end editor*.

Additionally, we provided an overview of the components and methodology we used to build the website. We also detailed its software and hardware hosting environment.

Closing, we should cite that at the time of writing of this document the GCC website was already capable to provide the functionality requirements that had been laid out in the project’s description. However, in addition to the existing commitment to keeping the GCC website running and up to date, the Greek Cybercrime Center consortium will continue looking through the whole remaining course of the project for features that could be integrated to it in order to provide an enhanced experience to the visitors.

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