

## ECSEL Research and Innovation actions (RIA)



# AMASS

## Architecture-driven, Multi-concern and Seamless Assurance and Certification of Cyber-Physical Systems

### AMASS open source platform provisioning and website (b) D7.6

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## TABLE OF CONTENTS

<b>Executive Summary.....</b>	<b>5</b>
<b>1. Introduction.....</b>	<b>6</b>
<b>2. The AMASS Open Platform.....</b>	<b>7</b>
<b>3. Stakeholders.....</b>	<b>8</b>
<b>4. Updated version of the OpenCert and AMASS Open Source platform website .....</b>	<b>9</b>
<b>5. Website content summary and future work .....</b>	<b>12</b>
<b>References .....</b>	<b>13</b>
<b>Appendix A: Updating the OpenCert website .....</b>	<b>14</b>
Clone the current website repository .....	14
Add your content .....	15
Add a Blog or News entry .....	17
Check your modifications .....	17
Push the changes.....	18
Build the website.....	19
Check online.....	20

## List of Figures

Figure 1.	AMASS Open Source platform architecture .....	7
Figure 2.	OpenCert website home page <a href="https://www.polarsys.org/opencert/">https://www.polarsys.org/opencert/</a> .....	9
Figure 3.	New page to list training material <a href="https://www.polarsys.org/opencert/resources/training/">https://www.polarsys.org/opencert/resources/training/</a> .....	10
Figure 4.	Updated About page <a href="https://www.polarsys.org/opencert/about/">https://www.polarsys.org/opencert/about/</a> .....	11
Figure 5.	OpenCert committers <a href="https://www.polarsys.org/projects/polarsys.opencert/who">https://www.polarsys.org/projects/polarsys.opencert/who</a> .....	12
Figure 6.	OpenCert website directory structure .....	15
Figure 7.	OpenCert WWW project in Eclipse .....	16
Figure 8.	Index.md file content .....	16
Figure 9.	Hugo server window.....	17
Figure 10.	Visualize website update before commit .....	18
Figure 11.	Commit a change to the repository .....	19
Figure 12.	Jenkins dashboard with the OpenCert “build-and-publish-website” job.....	20

## List of Tables

Table 1.	Matrix of assets provided on the website for each visitor profile .....	8
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## Executive Summary

This report is the second revision of the deliverable “AMASS open source platform provisioning and website”, released as part of task T7.3 (Building and Coordination of AMASS Open-Source Community), of AMASS WP7 (Industrial Impact and Community Building). It improves and completes deliverable D7.5 “AMASS open source platform provisioning and website (a)” [3], which was delivered in July 2017.

Since its inception, the AMASS consortium has considered the use of open source distribution mechanisms and engagement in community building activities as critical considerations for the sustainability of AMASS results and the AMASS Open Platform. This report presents the improvements made to the OpenCert and AMASS Open Platform website since its release in June 2017.

This document follows deliverables D7.3 “AMASS open source platform project proposal” [1] and D7.4 “AMASS open source platform marketing and outreach plan” [2], which describe the creation of the AMASS Open Platform constituted by the OpenCert [5], CHESS [7] and EPF [10] projects, and presents the plan to promote the platform.

This deliverable presents how the AMASS Open Platform website is designed to address the needs of different profiles of visitors, the technology selected to implement it, its contents as of March 2018 and some future work planned for it.

# 1. Introduction

AMASS is creating and consolidating a *de-facto* assurance and certification open tool platform, published in open source in the PolarSys Working Group [12], which is the Eclipse Working Group dedicated to Open Source tools for Systems Engineering and Embedded Systems.

This document presents the second version of deliverable “AMASS open source platform provisioning and website”, released as part of the AMASS WP7 (Industrial Impact and Community Building). The first version of the website was released in June 2017 [3]. Since then, the website has been updated to publish new content. This deliverable describes how the website’s design addresses the needs of different profiles of visitors of the website.

The use of open source distribution mechanisms makes it easy for users to test an open platform before adopting it, but in order to be successful, an open source project must provide not only interesting features, but also good online resources and documentation. In the updated version of the website, we have introduced a new area called “Resources”, which lists resources available to users and adopters of the AMASS open source platform. This website area has been added to convince website visitors to adopt the OpenCert platform by providing extensive documentation and material to increase their confidence in the project and reduce their perceived risk of adopting it.

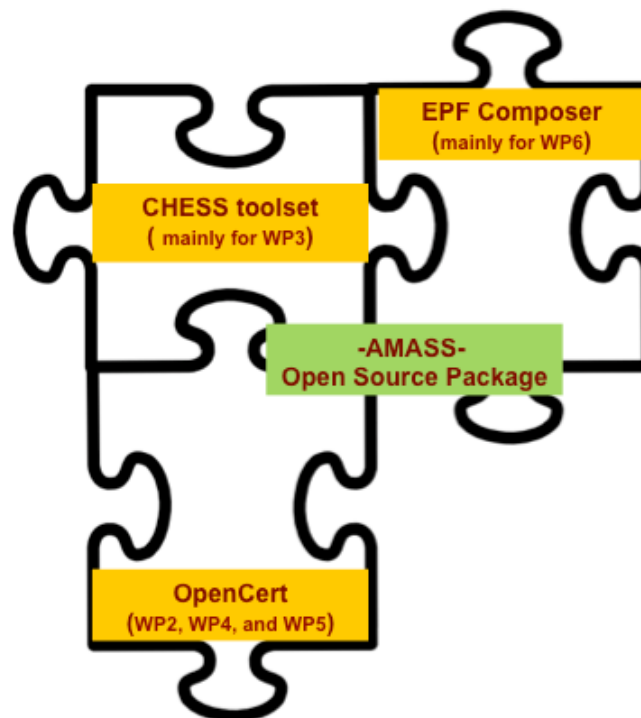
The subsequent sections of this deliverable are structured as follows:

- Chapter 2 outlines the structure of the AMASS Open Platform.
- Chapter 3 presents a matrix of online assets targeted at different profiles of website visitors.
- Chapter 4 presents the updates made to the website since its initial version (described in D7.5 [3]), discusses the rationale for them where appropriate, and includes screenshots highlighting new and improved pages on the website.
- Chapter 5 summarizes the contents of the website and lists future work planned for it.
- Appendix A provides a tutorial on how to update the website, or more specifically, how to write a change and submit it to the project team as a contribution.

## 2. The AMASS Open Platform

As described in D7.3 AMASS open source platform project proposal [1] Section 5, the AMASS Open Platform puts together several Open Source projects that cover the activities of the different work packages of the project (Figure 1):

- **PolarSys OpenCert [5]** is the core of the AMASS Open Source platform. OpenCert, which was created by the members of the OPENCROSS research project [6], supports evidence management, assurance case specification and part of the compliance management functionalities from the Basic Building Blocks. It will also include new functionalities implemented during the AMASS project.
- The **PolarSys CHESS [8]** toolset, which was created by the CHESS research project [7] and continued by SafeCer [9], adds support for Architecture-Driven Assurance. The CHESS toolset leverages another important PolarSys project, the Papyrus [10] platform for UML (Unified Modelling Language) design and profiles, including system modelling with SysML (Systems Modelling Language).
- **EPF Composer [11]**; this pre-existing Eclipse project, created by IBM some years ago and already used in the context of SafeCer, is a key component for WP6 “Cross-Domain and Intra-Domain Reuse”. The tool is used to describe and support the processes for Cross-domain and Intra-Domain reuse.



**Figure 1.** AMASS Open Source platform architecture

Concerning the provisioning of services for the OpenCert and CHESS packages, Section 4.3 of deliverable D7.3 describes the infrastructure and services provided by the Eclipse Foundation to its open source projects.

Each of the Eclipse and PolarSys [12] projects has its own lifecycle according to the Eclipse Development Process and its own website.

### 3. Stakeholders

Before designing the AMASS Open Platform website, the matrix shown in Table 1 was created to identify:

- The different profiles of stakeholders that may benefit from access to the website. These were identified by refining the profiles listed in Section 2 of deliverable D7.4 (AMASS open source platform marketing and outreach plan) [2].
- The different resources that website visitors from each stakeholder profile may find useful were it to be included on the website.

**Table 1.** Matrix of assets provided on the website for each visitor profile

Profiles/Asset	Download	General information	News / Press releases	Snapshots / Videos	Code	Getting Started	Use cases / Success Story	User documentation	Reference / API documentation
<b>AMASS profiles</b>									
Safety Architect	X	X		X		X	X	X	
Tools Architect	X	X	X	X	X	X		X	X
Eclipse Modelling expert	X	X	X	X	X	X	X	X	X
AMASS open platform developer		X			X				X
<b>General profiles</b>									
Researcher	X	X			X	X			X
Developer / Maker	X	X			X	X		X	X
Journalist		X	X	X			X		
Industry / Decision maker		X	X	X			X	X	
Contributor	X	X			X	X		X	X

The goal of task 7.3 (Creation and Coordination of AMASS open source community) is to create a sustainable open source community that attracts attention from contributors and users both during the AMASS project and after it has finished.



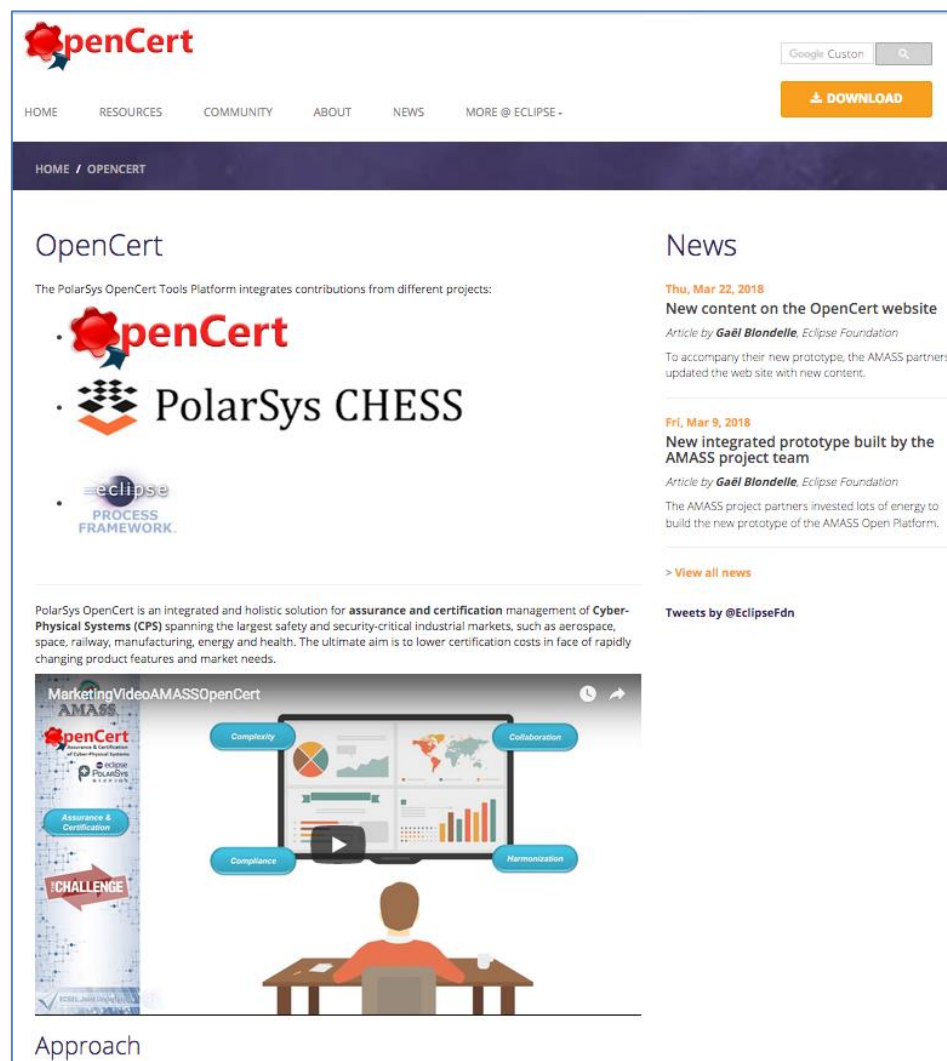
## 4. Updated version of the OpenCert and AMASS Open Source platform website

The project team selected to use Hugo [13] to create and maintain the OpenCert and AMASS Open Source platform website. Hugo is a command line tool that can create static websites based on few configuration files, a theme, and content written in the “Markdown” markup language [16].

Hugo has proven to be efficient in other contexts at Eclipse, including the Eclipse IoT Working group [14] and the App4MC [15] project, whose websites are managed with website generator technology.

One of the main advantages of Hugo is that it is fully consistent with the Eclipse development process, and the Eclipse Foundation provides a default template that looks professional and makes it easier to create a website for a project.

Since the publication of deliverable D7.5 [3], the partners have implemented a more automated mechanism to update the website, which uses a Jenkins job [17] to build the website from “source files” stored in an OpenCert git repository [18]. The website source files are reviewed using Gerrit [19].



**Figure 2.** OpenCert website home page <https://www.polarsys.org/opencert/>

The homepage of the OpenCert website (<https://www.polarsys.org/opencert/>) has been improved and now lists the different components of the platform upfront, and includes an introductory video of the OpenCert platform.

“Getting Started” and “Documentation” have been removed, and the content is now listed with other content like “Training” under “Resources”. More content will be added to this “Resources” page in the coming months to further support AMASS newcomers, users and adopters.

HOME
RESOURCES
COMMUNITY
ABOUT
NEWS
MORE @ ECLIPSE-

DOWNLOAD

HOME / OPENCERT / RESOURCES / TRAINING

## Online training

This page references the latest training material available for the OpenCert platform.

### Training - Winter series 2018

#### Training on the Prototype P1: WP3 Session #1 (26 Jan 2018)

- Workflow overview
- System Component Specification: Requirement specification
- Requirement Formalization: Formalize requirements with formal properties, Contract editor with content assist
- Requirement Early Validation: Metrics
- Functional Refinement: Architectural refinement, Contract refinement, Contract-based views

AMASS Prototype P1 WP3 Session#1			
- Requirement Formalization		INT – Stefano Puri	15 min
- Formalize Requirements with Formal Properties		FBK – Alberto Debiasi	10 min
- Define Contracts		N/A	5 min
- Questions			
- Requirement Early Validation			

#### Training on the Prototype P1: WP3 Session #2 (31 Jan 2018)

- Components nominal and faulty behaviour definition
- Functional early verification: Integration of CHESS and V&V tools, Contract refinement analysis, Contract validation, Contract-based verification of refinement
- Safety analysis: Fault tree generation, Contract-based safety analysis
- Safety Case: Generate product-based assurance arguments from CHESS model, Link architecture-related entities, Document generation
- Upcoming features: Savona, Simulation-based Fault Injection, Requirement Early Validation


AMASS Prototype P1 WP3 Session#2			
- Contract Validation		FBK – Alberto Debiasi	5 min
- Contract refinement analysis		FBK – Alberto Debiasi	5 min
- Contract-based Verification of Refinement for Strong and Weak Contracts		MDH – Irfan Sljivo	5 min

**Figure 3.** New page to list training material <https://www.polarsys.org/opencert/resources/training/>


A new page has also been added, which lists the Training videos published on the OpenCert YouTube channel ([https://www.youtube.com/channel/UCw\\_D0I5sDgysEphi6tzzDyw](https://www.youtube.com/channel/UCw_D0I5sDgysEphi6tzzDyw)).

## About


OpenCert is not a monolithic platform. The OpenCert Tool Platform is composed of various contributions that cover the different features:



- **OpenCert Core** toolset supports evidence management, assurance case specification and compliance management functionalities.



- The **Chess toolset** adds support for Architecture-Driven Assurance. The CHESS toolset leverages another important PolarSys project, the Papyrus platform for UML design and profiles.



- **EPF Composer** supports the process specification and process compliance.

The main contributions come from the **AMASS project**. The reuse of existing open source projects shows the pragmatism of the approach, and the application of a best practices of software engineering and open source communities: "join and contribute to existing communities" instead of "reinventing the wheel". As such, the OpenCert open source platform is a good example of the advantages of open source software that can be combined and extended more easily as all APIs and formats are open.




Figure 4. Updated About page <https://www.polarsys.org/opencert/about/>

## 5. Website content summary and future work

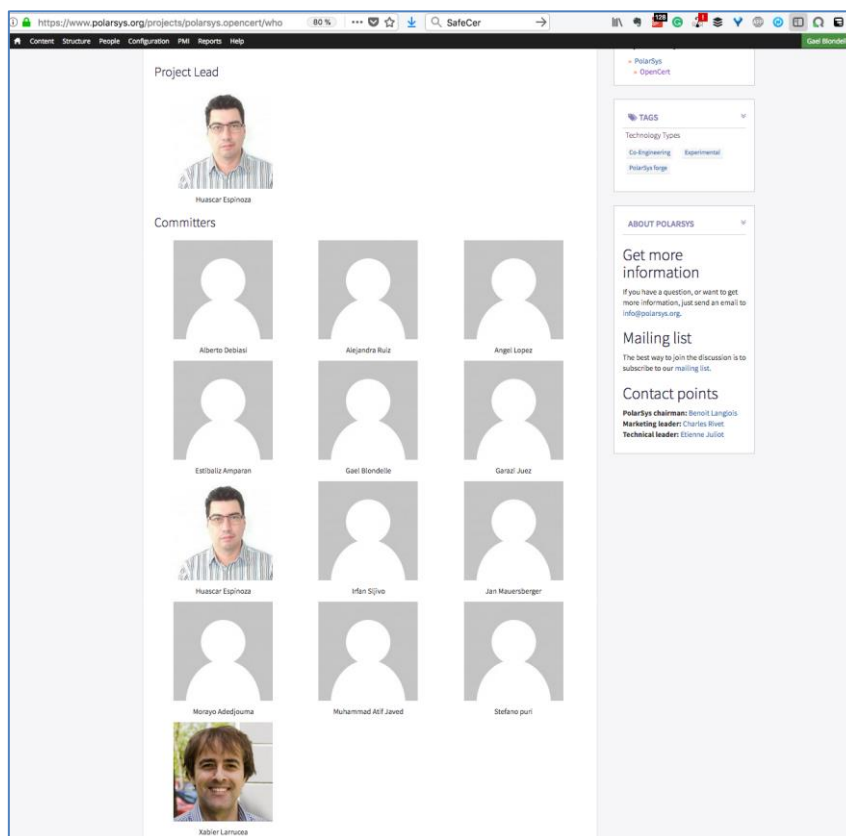
The current version of the AMASS Open Platform website (<https://www.polarsys.org/opencert/>) provides:

- General information about OpenCert
- Downloads of the OpenCert platform package (including OpenCert, Chess and Eclipse Process Framework)
- Support for news and blog posts
- Link to Source Code and downloads
- Getting Started documentation
- User's documentation
- Developer's documentation
- Training material linking to videos from the OpenCert YouTube channel

Since the initial release of the website (described in D7.5), significant effort has been made to comply with the Eclipse Development Process for the OpenCert platform. In particular, the project partners managed the elections of new committers for the PolarSys OpenCert (see Figure 5) and PolarSys Chess projects.

In addition to making a continuous effort to improve the content available on the website and keep this up to date, we will focus on:

- Adding more documentation for users and developers.
- Publishing Use Cases reports.



**Figure 5.** OpenCert committers <https://www.polarsys.org/projects/polarsys.opencert/who>

## References

- [1] [D7.3 AMASS open source platform project proposal](#)
- [2] [D7.4 AMASS open source platform marketing and outreach plan](#)
- [3] [D7.5 AMASS open source platform provisioning and website \(a\)](#)
- [4] AMASS ECSEL project website <http://amass-ecsel.eu/>
- [5] OpenCert project page <https://www.polarsys.org/projects/polarsys.opencert>
- [6] OPENCROSS research project <http://opencross-project.eu/>
- [7] CHESS research project <http://www.chess-project.org/>
- [8] PolarSys CHESS project <http://polarsys.org/chess/>
- [9] SafeCer Project <https://artemis-ia.eu/project/30-psafecer.html>
- [10] Papyrus project <https://www.eclipse.org/papyrus/>
- [11] Eclipse Process Framework Project (EPF) <https://eclipse.org/epf/>
- [12] PolarSys website <https://www.polarsys.org/>
- [13] Hugo website generator <http://gohugo.io/>
- [14] Eclipse IoT Working Group <https://iot.eclipse.org/>
- [15] App4MC <https://www.eclipse.org/app4mc/>
- [16] Markdown markup language <https://fr.wikipedia.org/wiki/Markdown>
- [17] OpenCert Jenkins job: <https://ci.polarsys.org/opencert/>
- [18] OpenCert website Git repository: <http://git.polarsys.org/c/opencert/www.git/>
- [19] OpenCert Gerrit review server: <https://git.polarsys.org/r/#/q/project:opencert/www>

## Appendix A: Updating the OpenCert website

This appendix presents a tutorial that explains how to add or modify the content of the OpenCert and AMASS Open Platform website.

To update the website, you must create content using the “Markdown” markup language and configure Hugo to build the new content. Then, you upload the generated website to the Git repository on the PolarSys forge. Finally, the generated website is pushed to the web server thanks to an automatic script.

Before editing any content for the OpenCert website, you must have the following tools installed on your computer:

- A command line terminal
- Git ([installing git](#))
- Hugo ([installing Hugo](#))
- A text editor, for “.md” files (Markdown content files) and “.toml” files (configuration files)

You may also find the following resources useful:

- [Markdown Reference Guide – Markdown is used to edit content on the website.](#)
- [Hugo Quickstart guide](#) - Hugo is the website engine used to generate static web content.
- [Gerrit documentation](#) - On the Eclipse and PolarSys forge, Gerrit is used to manage code submission and peer review. While using Gerrit, you will need to:
  - [Upload a change](#)
  - [Sign off](#) commits
  - Know your [http account / password](#)

### Clone the current website repository

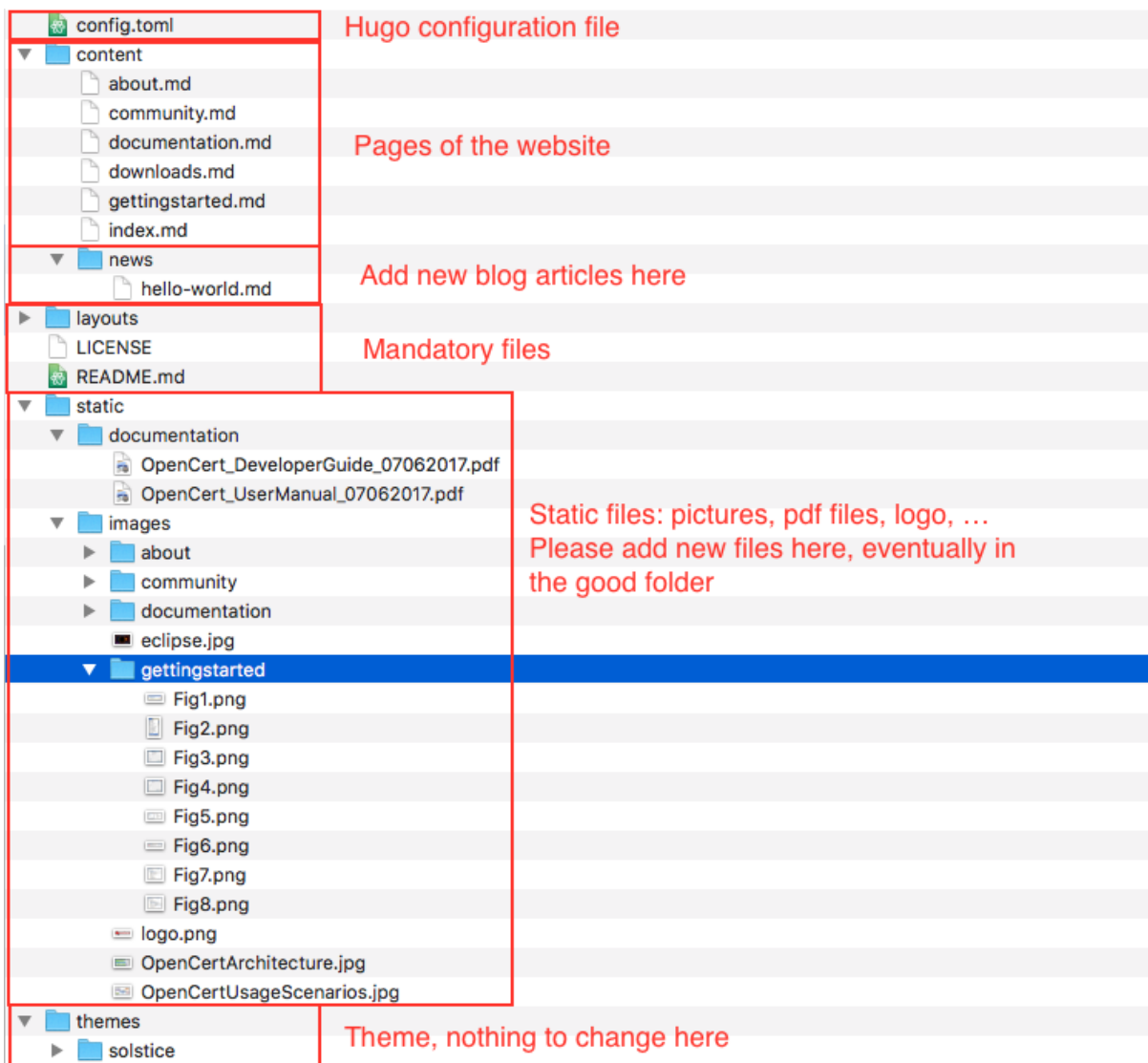
The website’s source files are hosted in a Git repository on the PolarSys forge. To add content, or modify content, you must first clone it on your hard drive to work locally.

```
git clone https://userid@git.polarsys.org/r/a/opencert/www opencert-www
```

This is the repository where all the Hugo source code is stored. Go to the “hugo” folder, and start to use the Hugo website engine.

```
cd hugo
```

Let's have a look at the structure:



**Figure 6.** OpenCert website directory structure

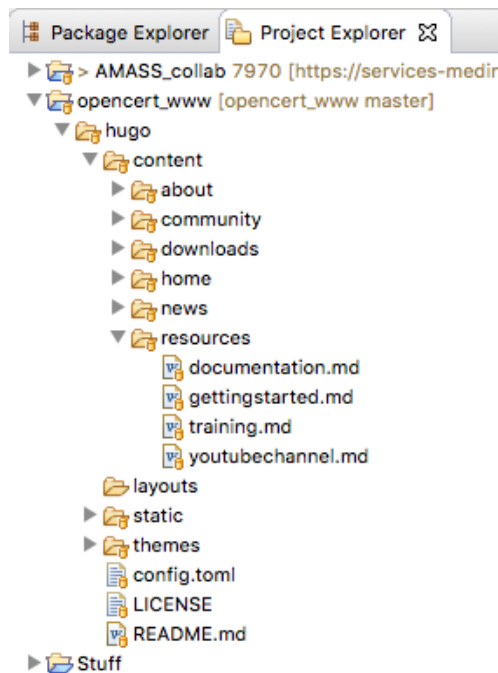
You can also import a project in Eclipse from the repository as indicated in Figure 7.

## Add your content

If you want to modify the content of a page, go to the “content” folder. Then open a file; change it using Markdown syntax and HTML.

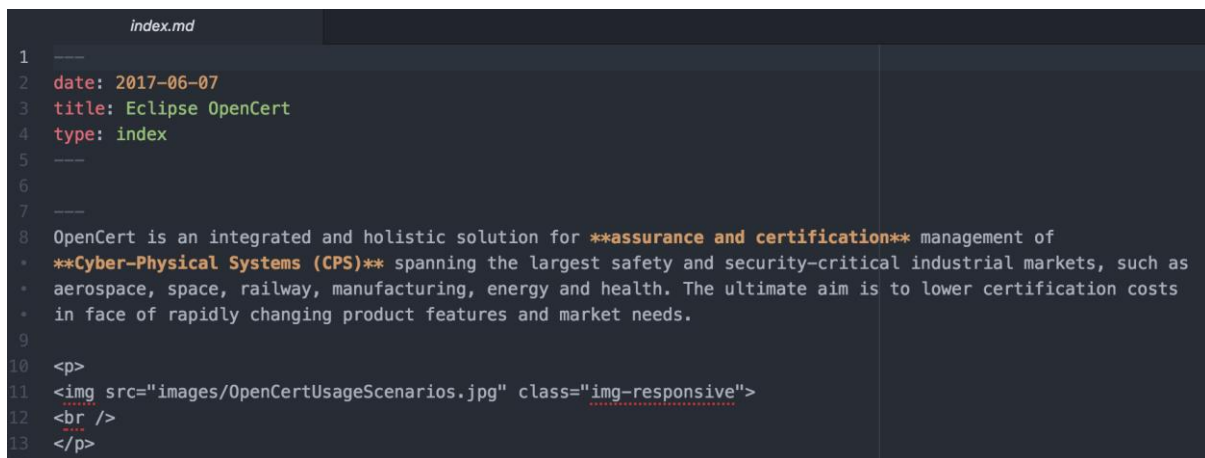
You can do this by using the file explorer and a text editor, or a command line tool.





**Figure 7.** OpenCert WWW project in Eclipse

The “index.md” file is used to generate the “index.html” static webpage:



**Figure 8.** Index.md file content

The top of the files include some meta data:

- *Date*
- *Title*
- *Type*

While *Date* and *Title* are available on all pages, “*type: index*” is only on the index page.

Markdown can be used for basic content, but it is also possible to use HTML. In this example, HTML is used to insert a picture.

Do not forget to save the file before launching the generator.



## Add a Blog or News entry

If you do not want to change content, but just want to add an article to the blog, then go to the “content/news” folder. Just copy the first news, change the file name, edit the metadata (*Date* and *Title*), add some content, and save.

The new article will be added to the news feed in the right column of the Home page and the RSS feed when the website is rebuilt.

Make sure you edit the *Date* metadata: the news feed is sorted using this value rather than the file modification date.

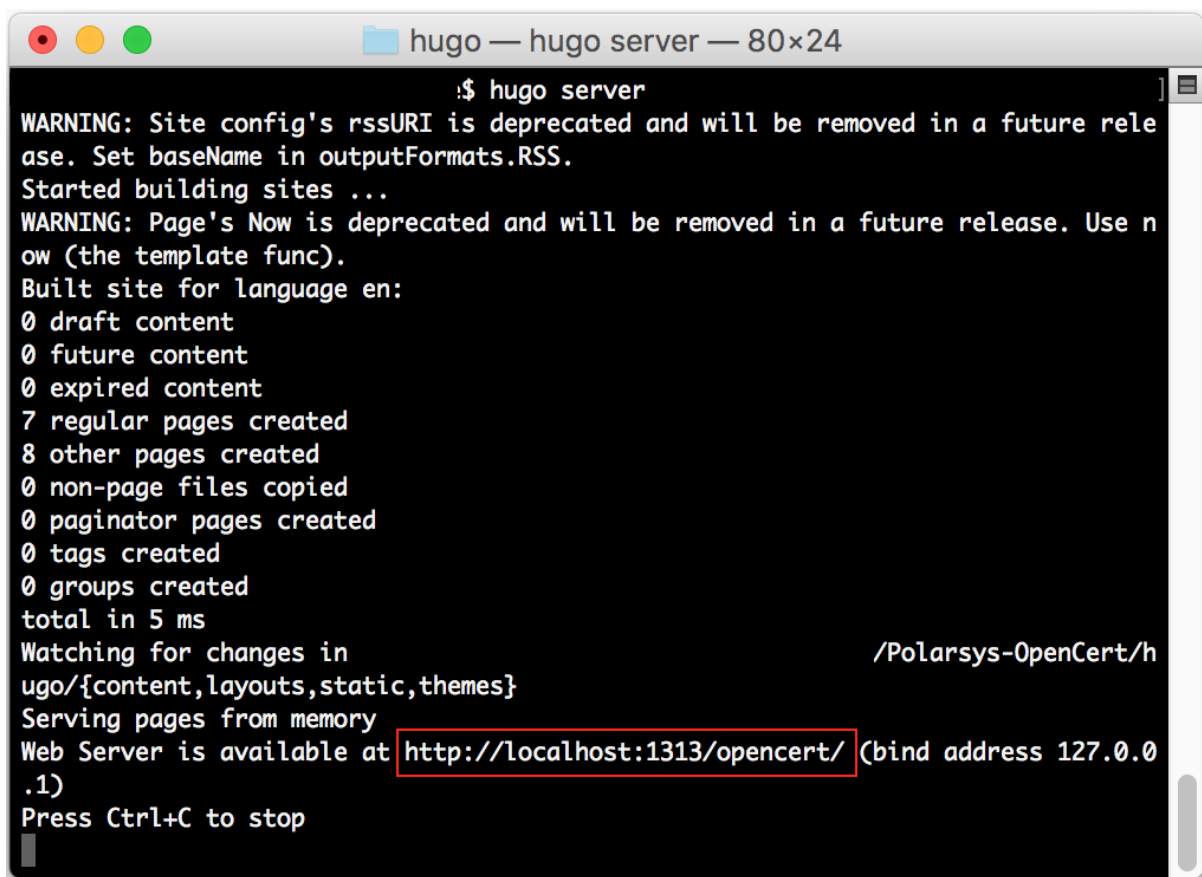
## Check your modifications

Before uploading the files to the web server, you must check your modifications. Hugo provides a very convenient way to do that: it has its own local webserver.

In the terminal, be sure to be in the “hugo” folder. Then, run:

```
hugo server
```

You will get:

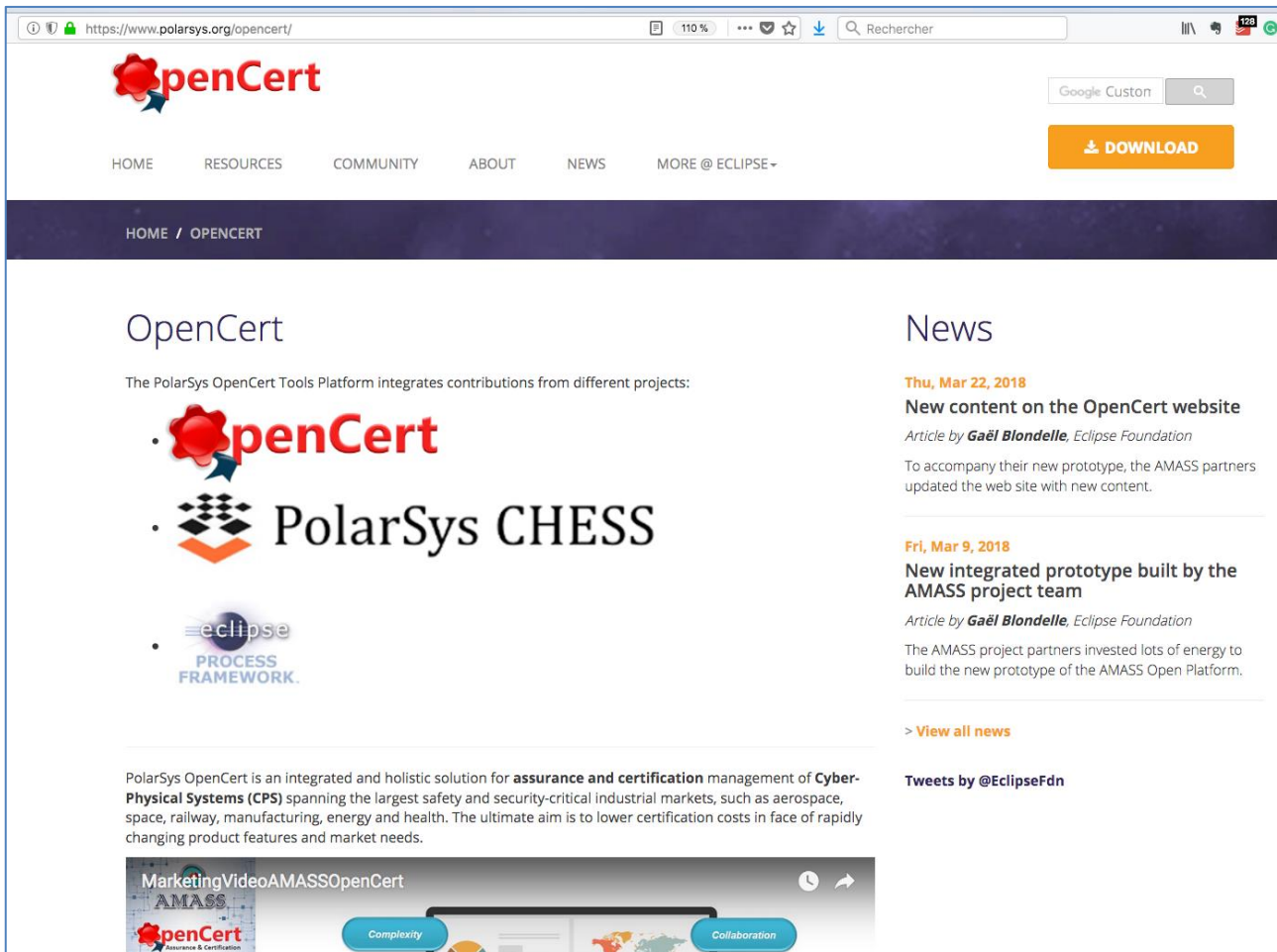


```
hugo server
WARNING: Site config's rssURI is deprecated and will be removed in a future release. Set baseName in outputFormats.RSS.
Started building sites ...
WARNING: Page's Now is deprecated and will be removed in a future release. Use now (the template func).
Built site for language en:
0 draft content
0 future content
0 expired content
7 regular pages created
8 other pages created
0 non-page files copied
0 paginator pages created
0 tags created
0 groups created
total in 5 ms
Watching for changes in /Polarsys-OpenCert/hugo/{content,layouts,static,themes}
Serving pages from memory
Web Server is available at http://localhost:1313/opencert/ (bind address 127.0.0.1)
Press Ctrl+C to stop
```

Figure 9. Hugo server window

This will generate a new version of the website, with the latest changes you have done on your computer. Then, it starts a local webserver.

Copy and paste the web address in your web browser.



**Figure 10.** Visualize website update before commit

You can browse the website to check your modification. In some cases, you might have to force refresh the content in the browser, e.g. with “ctrl+r”.

To stop the web server, go back to the terminal and press “ctrl+c”.

You are ready to push the content online.

## Push the changes

Go back to the website root. You must be in “/opencert\_www/”, not in “/opencert\_www/hugo”.

First, add the changes and new files (like news or pictures) to git:

```
git add *
```

Then, commit your changes:

```
git commit -m "add a description here" -m "Signed off by: Firstname Name <email@email.com>"
```

Please change “add a description” with a quick description of your change. And change “Firstname Name <email@email.com>” with your personal information. This must be the same than on your Gerrit profile: see <https://git.polarsys.org/r/#/settings/>

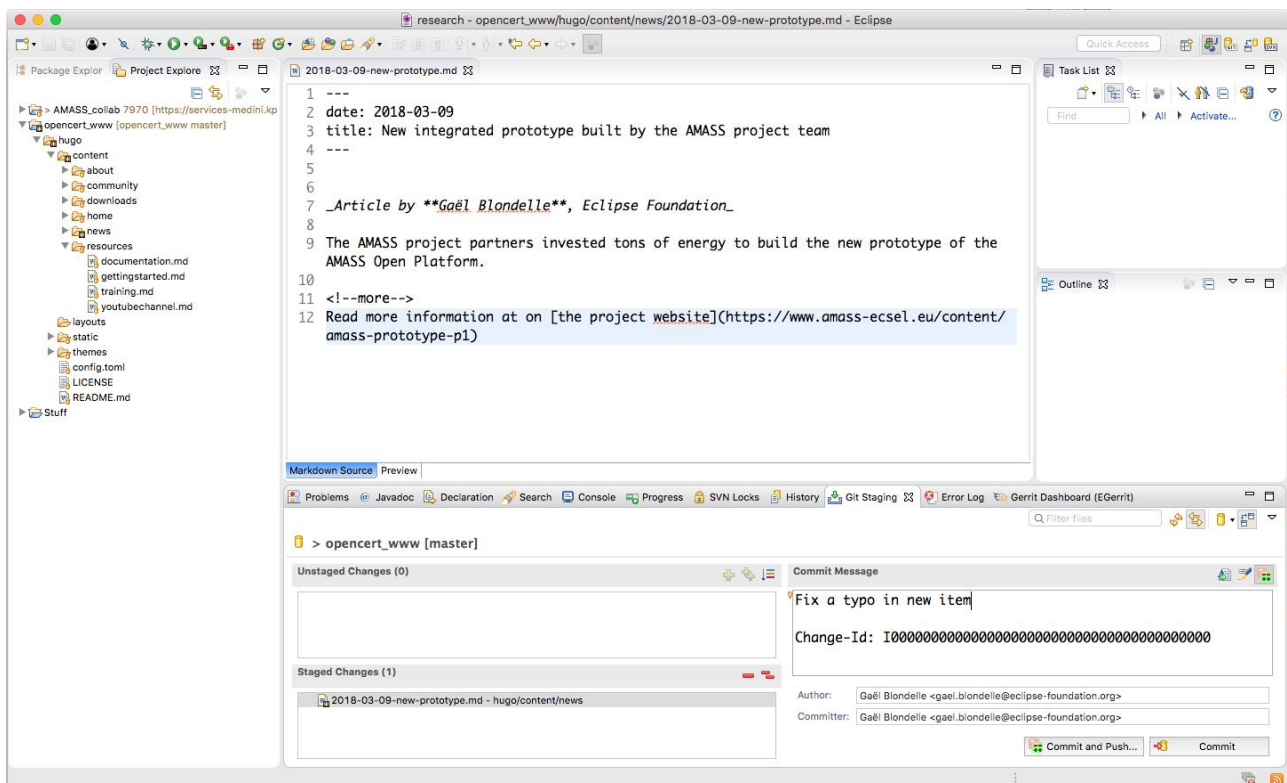
If you are not signing off your commit, it will be refused by the git server.

Check your Gerrit credentials and submit your commit for review:

```
git push origin HEAD:refs/for/master
```

Then, contact OpenCert project's committers and ask them to review your commit. They can see it in their "Incoming reviews" list at <https://git.polarsys.org/r/#/dashboard/self>.

An alternative is to use Eclipse to commit the change as shown below:

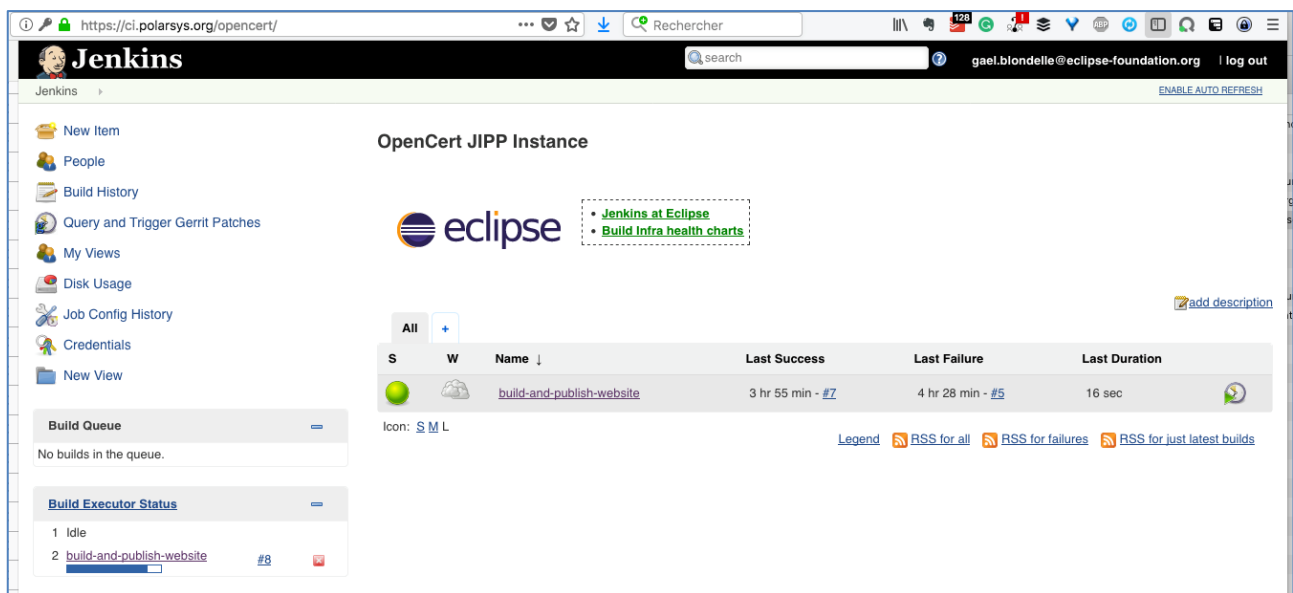


**Figure 11.** Commit a change to the repository



## Build the website

We use a Jenkins Job to publish the website automatically from the latest source in the Git repository. The job "compiles" the web site with Hugo, then compares with the online version, and updates it if necessary.

As such, you don't need to do anything to rebuild the website.



The screenshot shows the Jenkins web interface. The top navigation bar includes the Jenkins logo, a search bar, and the user 'gael.blondelle@eclipse-foundation.org'. The left sidebar contains various navigation links. The main content area is titled 'OpenCert JIPP Instance' and features the Eclipse logo. Below the logo, there is a table showing the build history for the 'build-and-publish-website' job.

S	W	Name ↓	Last Success	Last Failure	Last Duration
		<a href="#">build-and-publish-website</a>	3 hr 55 min - #7	4 hr 28 min - #5	16 sec

Below the table, there is a section for 'Build Queue' which is currently empty, and a 'Build Executor Status' section showing two executors: 'Idle' and 'build-and-publish-website' (which is currently running).

**Figure 12.** Jenkins dashboard with the OpenCert “build-and-publish-website” job

## Check online

Once pushed, it takes a few minutes to see the change on the website. You may have to force reload of the content of a page using “ctrl+r” in your browser.