



Advanced Secure Cloud Encrypted Platform for Internationally Orchestrated Solutions in Healthcare

Project Acronym: **ASCLEPIOS**
Project Contract Number: **826093**

Programme: **Health, demographic change and wellbeing**
Call: **Trusted digital solutions and Cybersecurity in Health and Care
to protect privacy/data/infrastructures**
Call Identifier: **H2020-SC1-FA-DTS-2018-2020**

Focus Area: **Boosting the effectiveness of the Security Union**
Topic: **Toolkit for assessing and reducing cyber risks in hospitals and care
centres**
Topic Identifier: **H2020-SC1-U-TDS-02-2018**

Funding Scheme: **Research and Innovation Action**

Start date of project: 01/12/2018

Duration: 36 months

Deliverable: D7.2 Project Website and Web 2.0 Channels

Due date of deliverable: 28/02/2019

Actual submission date: 26/02/2019

WPL: ICCS

Dissemination Level: Public

Version: final



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3 Status, Change History and Glossary

Status:	Name:	Date:	Signature:
Draft:	ASCLEPIOS D.2 Project Website and Web 2.0 Channels	14/2/2019	
Reviewed:	Michael Witt, HTW Berlin	19/2/2019	
Approved:	Tamas Kiss	26/2/2019	

Table 1: Status Change History

Version	Date	Pages	Author	Modification
V1.0	14/2/2019	18	Jenny Psarra, Yiannis Verginadis, Gregoris Mentzas	Initial draft
V2.0	25/2/2019	16	Dimitris Apostolou	Addressing review remarks

Table 2: Deliverable Change History

Glossary

ABE	Attribute Based Encryption
SSE	Symmetric Searchable Encryption
FE	Functional Encryption

Table 3: Glossary

4 Introduction

This deliverable describes the project web site. The registered URL of the website is <https://www.asclepios-project.eu/>. The website will be the anchor for all communication activities related to the project and serve as a central point of entry for all public material, including the project's basic information, resources and public deliverables. The website will be continuously updated with news, links to other relevant sites, details of published papers, conferences and exhibitions during the project and will remain active during two years after the project's finalization.

The website platform follows the corporate visual identity of the project created by ICCS and approved by partners, and it gives access to ASCLEPIOS social media channels (Twitter and LinkedIn). Considering that different authors might update the site, a Content Management System has been adopted, to easily and quickly publish the content. It is essential that the website is optimised for browsing on tablets and smart phones, so the website has been developed using a responsive design approach.

5 Website

1.1 Dissemination, Communication and Exploitation Objectives

The website of the ASCLEPIOS project is a dynamic site which provides the appropriate content to the user. The website includes information about the project purpose, its consortium, the project's publications, papers and deliverables and the media coverage of the project. Furthermore, links to social media, in our case to Twitter and LinkedIn, are of vital importance for the broader dissemination of the ASCLEPIOS project.

The implementation of the ASCLEPIOS project website has been created using the Wordpress¹ Content Management System. The website aims to be accessible from various desktop and mobile devices so that users can view the content from their mobile phone, their tablet or their personal computer. The website's content is going to be extended during the project's runtime and aims to inform website visitors even two years after its completion. There are going to exist several articles in the ASCLEPIOS website's blog which are going to inform the audience about the current news, innovations and evolution of the innovative scientific field of novel cryptographic approaches in cloud-based e-health systems.

The ASCLEPIOS project website's goal is not only to inform but also to actively engage the audience to participate and bring value to this scientific project. Apart from making public the project's vision, the website aims to give its followers the opportunity to actively participate in the project as volunteers.

5.1 Structure

Figure 1 illustrates the structure of ASCLEPIOS project website. The structure is organized based on topics such as project information, its consortium, project publications, media and contact information.

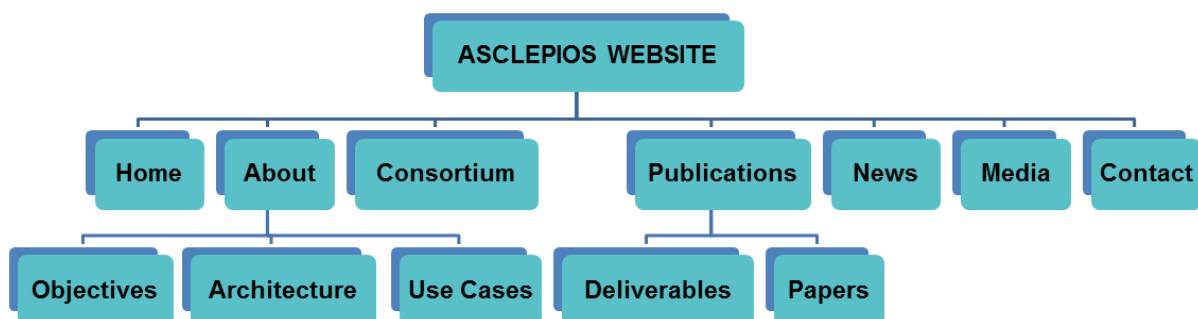


Figure 1: ASCLEPIOS STRUCTURE

Specifically, the website consists of the following six main menu tabs:

- Home (which can always be reached by pressing the ASCLEPIOS Project logo)
- About
- Consortium
- Publications
- News
- Contact

The menu items “About” and “Publications” contains submenu items to provide a more structured access to information to the visitors.

¹ <https://wordpress.com>

5.2 Contents

Each of the six website areas contain content that aims to deliver to the users' information about the project's identity and new scientific findings, achievements, milestones and progress. In addition to that, the website's visitors are going to be informed about advancements in mechanisms for personal data protection in the scientific field of healthcare services.

5.2.1 Homepage

The homepage is the first page that the website's visitors are able to read. The homepage presents the core of the ASCLEPIOS project vision and purpose. It describes the main challenge that needs to be tackled, i.e., security of health personal records. It also describes the project aspiration to create security mechanisms for health records protection. The homepage is loaded when the hyperlinked logo image is being clicked.

The homepage's content is presented below:

“ADVANCED SECURE CLOUD ENCRYPTED PLATFORM FOR INTERNATIONALLY ORCHESTRATED SOLUTIONS IN HEALTHCARE

The vision of ASCLEPIOS is to maximize and fortify the trust of users on cloud-based healthcare services by developing mechanisms for protecting both corporate and personal sensitive data. While researchers have developed many theoretical models that could enhance the security level of healthcare services, only a rudimentary set of techniques are currently in use. ASCLEPIOS is exploiting this gap by using by utilizing several modern cryptographic approaches to build a cloud-based eHealth framework that protects users' privacy and prevents both internal and external attacks.

ASCLEPIOS offers the ability to users to verify the integrity of their medical devices before receiving them while receiving simultaneously certain guarantees about the trustworthiness of their cloud service provider. Furthermore, ASCLEPIOS offers a novel solution through which healthcare practitioners and medical researchers are able to calculate statistics on medical data in a privacy-preserving way. Finally, various activities will be organized by the project to raise awareness in the healthcare industry. All these results will be shown by three demonstrators provided by ASCLEPIOS healthcare partners, involving three leading European hospitals.”

5.2.2 About

The second menu page is the About page. This page includes three submenu pages which are the following: “Objectives”, “Architecture” and “Use cases”.

5.2.2.1 Objectives

The Objectives page is dedicated to providing content about the main objectives of ASCLEPIOS project. First, a crucial objective of this project is to provide a brand new cryptographic algorithm which will be able to combine two powerful security algorithms which are the Attribute Based Encryption (ABE) and Symmetric Searchable Encryption (SSE). This merge aims to address prominent security issues in the field of multi-cloud security in the healthcare industry. In addition to that, securing techniques for data sharing is another issue the project addresses. Further objectives are the successful revocation of a users access to health records of a patient as well as the implementation of these mechanisms in the three project's demonstrators. A final objective is to aspire the medical community to utilize these safety mechanisms to protect the medical records of their patients.

The “Objectives” page content is the following:

“The **Advanced Secure Cloud Encrypted Platform For Internationally Orchestrated Solutions In Healthcare** project has the following research and technological objectives:

1. Explore the possibility of combining Symmetric Searchable Encryption and Attribute-Based Encryption to enable using both encryption schemes in the most efficient way in order to store and process medical data.
2. Enable effective user access revocation approaches that do not affect other users or the overall functionality of the service.
3. Develop protocols that allow healthcare practitioners, researchers and patients to share data securely and in a privacy-preserving way.
4. Design and implement mechanisms allowing users of eHealth services to verify the integrity, and trustworthiness of the overall system, including medical devices.
5. Enable healthcare professionals to generate analytics and statistical measurements in a privacy-preserving way.
6. Raise awareness about security among healthcare professionals
7. Showcase the technical results of the project on three healthcare demonstrators“

5.2.2.2 Architecture

The second submenu page is the Architecture page. This page demonstrates the Architecture diagram of ASCLEPIOS project. The ASCLEPIOS architecture consists of five discrete layers: the cloud infrastructure layer, the crypto layer, the control layer, the data analytics layer and the secure execution layer. The architecture page includes a figure of the architecture and a short description of its layers, as follows:

- **Cloud Infrastructure Layer:** Cloud Infrastructure Layer: ASCLEPIOS will deploy large scale demonstrators in order to prototype the results and outcomes of the project.
- **Secure Execution Layer:** This layer will implement pluggable applications to support the security functionality of the ASCLEPIOS architecture.
- **Crypto Layer:** The crypto layer will be implemented as a collection of cryptographic algorithms and will form one of the key components for both the security and the main functionality of ASCLEPIOS.
- **Analytics Layer:** One of the core functionalities of ASCLEPIOS is to allow authorized members of a healthcare organization to perform analytics based on medical data.
- **Control Layer:** The control layer will introduce the appropriate methods and tools to implement an efficient and flexible access policies enforcement middleware, adequate for modern cloud-enabled healthcare systems.

5.2.2.3 Use Cases

The third submenu is the “Use Cases” page. This particular page describes the three pilots which are going to measure the efficiency of the created mechanisms of ASCLEPIOS project. More particularly, the three project pilots are: the Norwegian Centre for E-Health Research (NSE), The Amsterdam University Medical Centers (AMC) and Charité.

The content of the page “Use Cases” is the following:

“Pilots Implementation and ASCLEPIOS Demonstrators

To demonstrate the usability of the investigated and developed security framework, ASCLEPIOS will implement three advanced demonstrators based on real-life scenarios provided by project partners from the healthcare sector.

1. Data sharing for improved decision in stroke acute care by AMC
2. Collaboration and analysis platform for inpatient and outpatient sleep medicine by CBMI and Charité

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3. Privacy-Preserving monitoring and benchmarking of antibiotics prescription by NSE ”

5.2.3 Consortium

The third page refers to the project's consortium. The page shows a list of the partners and links to the institutions. ASCLEPIOS' consortium combines multidisciplinary competences and resources from academia, the healthcare sector, industry and research community focusing on applied cryptography, cloud security, privacy in eHealth, access control, big data and analytics. It consists of eleven (11) partners representing research institutes, universities, healthcare organizations and technology providers, partners from eight European Commission member states and industrialized third countries, i.e. Germany, Greece, Finland, the Netherlands, United Kingdom, Cyprus, Sweden and Norway. The ASCLEPIOS project brings together a team of experienced partners dedicated to contributing, each in their respective area of expertise, to the successful implementation of the project objectives.

5.2.4 Publications

The third menu page is the “Publications” page. This page includes two submenu pages which are the following: Deliverables and Papers. The “Publications” menu page, in its current version, when is pressed doesn't guide the page's visitor in a different page, but demonstrates these two submenu pages. In a website's future version, it is possible to display content in a different page which will be dedicated in distributing content in the Publications page.

5.2.4.1 Deliverables

The “Deliverables” submenu page consists of a table which contains all the public deliverables of ASCLEPIOS project which are going to be created during these three years. More particularly, this table contains the following fields: the deliverable number, the deliverable title, the lead beneficiary and the deliverable type (Demonstrator or Report). Once a public deliverable has been accepted, a link will be provided to grant access to the deliverable's content.

The “Deliverable” submenu page contains the following content (Table 4):

D1.1	ASCLEPIOS Technical, Security, Healthcare and Data Privacy Requirements	UNN	Report
D1.2	ASCLEPIOS Reference Architecture, Security and eHealth Use Cases, and Acceptance Criteria	TUT	Report
D2.1	Symmetric Searchable Encryption and Integration in Medical Devices	RISE	Report
D2.2	Attribute-Based Encryption, Dynamic Credentials and Ciphertext Delegation and Integration in Medical Devices	TUT	Report
D2.3	GDPR-compliant and Privacy-Preserving Analytics for Healthcare Providers	SUITE5	Report
D2.4	Data Owners' and Personal Health Data Privacy-	UNN	Report

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Preserving Analytics			
D3.1	ASCLEPIOS Security and Policies Model	ICCS	Report
D3.2	ASCLEPIOS Models Editor and Interpretation Mechanism	ICCS	Report
D3.3	Context-aware ABAC Enforcement Mechanism	UBITECH	Report
D4.1	Design of protocols for key, firmware and workload management in ITEEs for medical devices	RISE	Report
D4.2	Remote attestation of workloads in ITEEs	RISE	Report
D4.3	Interoperability of ITEEs in the context of eHealth systems	TUT	Report
D5.1	Technical Integration Points and Testing Plan	UBITECH	Report
D5.2	ASCLEPIOS Integrated Platform – Early Release	UBITECH	Demonstrator
D5.3	ASCLEPIOS Integrated Platform – Final Release	UBITECH	Demonstrator
D6.1	Report on Cloud Computing Testbed	UOW	Report
D6.3	Early Prototype Demonstrators	UOW	Demonstrator
D6.4	Final Demonstrators	UOW	Demonstrator
D7.1	Plan for Project's Dissemination, Communication and Stakeholder's Plan	SUITE5	Report
D7.2	Project Website and Web 2.0 Channels	ICCS	Websites, patents filling, etc.
D7.3	Interim Dissemination, Communication and Stakeholders' Activity Report	SUITE5	Report
D7.5	Final Dissemination, Communication and Stakeholders' Activity Report	SUITE5	Report
D7.6	Final Project Exploitation and Sustainability Report	SUITE5	Report

Table 4: Target Audiences for Dissemination and Communication

5.2.4.2 Papers

The "Papers" submenu page consists of a table which contains all papers which have been publicised in relation to the ASCLEPIOS project. So far, this table contains the publication of Antonis Michalas with the title "The lord of Shares".

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The “Papers” submenu page will be constantly updated and will contain content as shown below:

Antonis Michalakis	The Lord of Shares: Combining Attribute-Based Encryption and Searchable Encryption for Flexible Data Sharing	In Proceedings of the 34th AMC/SIGAPP Symposium On Applied Computing (SAC). Limassol, Cyprus, April 08-12, 2019
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Table 5: Indicative News Listing

5.2.5 News

The “News” menu page will inform the website’s visitors about its results, the current dissemination events and general news of the ASCLEPIOS project progress. This page contains posts full of current news of the project’s overall progress.

5.2.6 Media

This page is going to contain a press kit, including the brochure and the poster of the project.

5.2.7 Contact

The last menu page consists of a contact form with which visitors can send an email to the ASCLEPIOS project admin. In this contact form the visitor types his/her name, his/her email account and his/her message to the ASCLEPIOS website admin.

5.3 Layout

The website menu is available from all pages, allowing visitors to find the information that they are interested in no matter how they arrived on the site. The overall design and homepage of the website includes the following elements:

Header:

To the header of ASCLEPIOS project website, the visitor can see following components:

- 1) A slider of animated images which contain representative phrases of ASCLEPIOS project goals.
- 2) A menu bar which contains: the hyperlinked logo of ASCLEPIOS project, the About menu page, the Consortium menu page, the Publications menu page, the News menu page, the Media menu page, the Contact menu page.
- 3) Access to Social Media platforms (Twitter and LinkedIn).

Footer:

- 1) European Union logo to appear in the footer.
- 2) Under the logo will appear the phrase “The Asclepios project is titled “Advanced Secure Cloud Encrypted Platform for Internationally Orchestrated Solutions in Healthcare” and has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 826093”.
- 3) The name and the email account of the project coordinator.

5.4 Analytics

The website will make use of the Google Analytics service that will perform a detailed analysis of the website statistics.

5.5 Site hosting, installation & maintenance

The website is hosted by Suite5 while ICCS is responsible for its maintenance during its three-year duration and two years after its finalisation.

5.6 Data protection

The ASCLEPIOS website is compliant with all European requirements and standards with regards to data protection and observes the GDPR. In all pages of the ASCLEPIOS project website, there is a visible a text bar at the footer of the website which informs about the cookie policy which complies with the EU cookie law GDPR regulations.

6 Web 2.0 Channels

The communication through social media (Twitter [https://twitter.com/Asclepios_H2020] and LinkedIn [<https://www.linkedin.com/showcase/asclepios-project>]) is of vital importance for the execution and exposure of ASCLEPIOS project. The social media are very significant for communicating to the world the existence, the values and the purpose of ASCLEPIOS. In our case, as a consortium we agreed in creating a LinkedIn and a Twitter account. We chose those two particular Web 2.0 channels because we consider them the most appropriate for our business profile. Besides, LinkedIn has proven its business-oriented structure as well as Twitter. Our channels are new, but we are certain that these channels are going to grow fast as far as we are concerned. We are going to grow our audience organically through our regular privacy and e-health orientated posts. The figures below show the project homepages in LinkedIn and Twitter.



Figure 2: Twitter Account



Figure 3: Indicative Twitter Content

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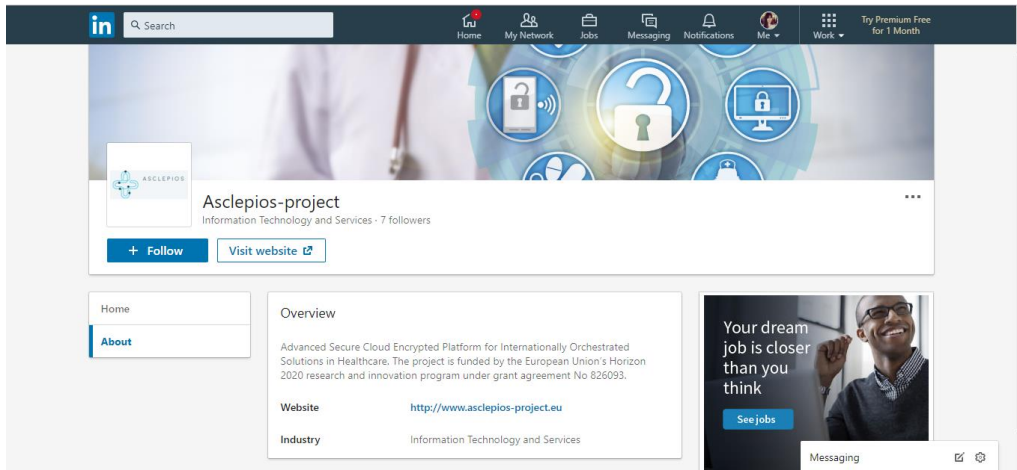


Figure 4: LinkedIn Account

The LinkedIn account of ASCLEPIOS was created as a showcase page, instead of a simple personal account. Showcase Pages are extensions of a LinkedIn Page, designed to spotlight a brand, business unit or initiative.

7 Conclusions

This report documents and accompanies Deliverable D7.2, which is the initial design and implementation of the project Website and associated social media channels. The web site has been in operation from the second month of the project and has already received updates by taking into account an initial set of comments from project partners about both the structure and the content of the website. Moreover, changes have been made in visual design elements, the responsiveness, the functionality and the security of the website.

The content of the website will be continuously updated and enhanced in order to disseminate the project results and achievements. Moreover, a social media communication strategy is being put in place in order to maintain a professional presence of the project on the selected media.