*Digital Europe Programme Project **QCI-CAT***
QCI: Proof of Concept – Secure Connectivity Austria
Digital Europe Work Program 2021-2022
EU Secure Quantum Communication Infrastructure (DIGITAL-2021-QCI-01)
Project number: 101091642

Project starting date: fixed date: 1 January 2023
Project end date: 30 June 2025
Project duration: 30 months

Document:	**Deliverable**
Type:	Report
Dissemination Level:	Public
Title:	**QCI-CAT Web Page**
Work-Package	WP10
Document number:	**D10.1**
Document Owner:	AIT / Hannes Hübel
Contributors:	AIT
Abstract:	Overview of the QCI-CAT website and contact information of the coordinator.
Key words:	Website, News, Contact
Pages	22
Delivery Date Planned	2023-03-31 (M3)

Revision History

Version	Revision Points	Author(s) & Organization	Date
V 1.0	Initial version	K. Osman (AIT)	2023-03-17
V 1.1	Update Chapter 2 and 3	K. Osman (AIT)	2023-03-27
V 1.2	Update Chapter 1	K. Osman (AIT)	2023-03-28
V 1.3	Adding "Newsletter" and "Privacy" to Chapter 2	K. Osman (AIT)	2023-03-30
V 1.4	Finalization	M. Kos, S. Ramacher (AIT)	2023-03-31
V 2.0	Update after Expert Review	S. Ramacher (AIT)	2024-05-10

Author List

Organization	Name	E-Mail address
AIT	K. Osman	karim.osman@ait.ac.at
AIT	M. Kos	manuela.kos@ait.ac.at
AIT	S. Ramacher	sebastian.ramacher@ait.ac.at

Reviewer List

Organization	Name	E-Mail address
ALL	QCI-CAT Consortium	-

Copyright Statement

Funding Acknowledgement:

This project has received funding from the European Union's Digital Europe Work Programme 2021-2022 under Project number: 101091642.

Table of content

Revision History 2
Author List 2
Reviewer List 2
Copyright Statement 2
Funding Acknowledgement: 2
List of Figures 3
Executive Summary 5
1. Introduction 6
1.1. Purpose and scope of the document 6
1.2. Target Audience 6
1.3. Relation to other project work 6
1.4. Structure of the document 6
2. Structure and subpages of the project website 7
2.1. Landing Page 8
2.2. News 9
2.3. Overview 11
2.3.1. Objectives 11
2.3.2. Partners 12
2.3.3. Use Cases 13
2.4. Results 15
2.4.1. Deliverables 15
2.4.2. Publications 16
2.4.3. Individual results 17
2.5. Contact 17
2.6. Privacy 18
3. Technical Implementation 18
Summary 20
Appendix A - List of Acronyms 21
Appendix B – Bibliography 22

List of Figures

Figure 1 - Website header with the project logo and the website menu 7
Figure 2 - Website footer with an “About QCI-CAT” section, important links and the funding acknowledgement. 7

Figure 3 - Landing Page (1/3) with headline 8
Figure 4 - Landing Page (2/3) with a short description of the project and a representation of the use cases 9
Figure 5 - Landing Page (3/3) with key facts and a selection of the partner logos. The partner logos are rotating to display all logos over some time frame. 9
Figure 6 - Listing of news entries on the "Project News" page. 10
Figure 7 - Sample news entry with the headline and the introduction. 10
Figure 8 - List of events on the "Events" page. 11
Figure 9 - Sample "Events" entry for the World of Quantum 2023. 11
Figure 10 - Header and two of the objectives as displayed on the "Objectives" page. 12
Figure 11 - Subset of the partner descriptions and their categorization on the “Partners” page. 13
Figure 12 - Overview of the use cases on the "Use Cases" page 14
Figure 13 - A subsection of the "HSM Backup using QKD" Use Case page. 15
Figure 14 - "Deliverables" subpage with the list of public deliverables. Download links will be added once the deliverables have been accepted. 16
Figure 15 - List of publications with their title, authors, key words, and links to the publisher's version of the publication and an open access link (if the publisher’s version is not open access). 16
Figure 16 - Subsection of the subpage on "FAEST" which targets cryptographic experts. 17
Figure 17 - Contact Page 18
Figure 18 - Report on the TLS connection offered by the webserver from Qualsys' SSL Labs 19
Figure 19 - Monthly visitor statistics for qci-cat.at in 2023. 20

Executive Summary

The QCI-CAT website https://qci-cat.at/ aims to be the first address on the Internet where the public can get information about the national EuroQCI project QCI-CAT. The website aims to maximize the visibility of the project within the research community but also the wider public. Hence it provides an overview of the project's goals and objectives, the partners involved, news, and project results. In addition, the website serves as a repository for various dissemination activities. The website is online since March 2023 and is updated on a regular basis during the project's lifetime.

1. Introduction

1.1. Purpose and scope of the document

The project website is one of the main communication channels of the project [1]. Hence, the website aims to give a high-level overview of the project objectives and use cases. Furthermore, it also serves as venue to present the project results from academic papers to software and hardware components that are developed within the project to a wider audience.

The purpose of this document is to present a general overview of the project's website which is available under the URLs https://qci-cat.at/, https://qci-cat.eu/, and https://qci.at/. It provides an overview of the different subpages available on the website as well as a description of the content that is intended to be published there in accordance with the communication and dissemination plan.

1.2. Target Audience

The target audience of the webpage is the general public.

1.3. Relation to other project work

This deliverable is closely related to D10.2 Dissemination, communication and exploitation plan which outlines the general strategy for the project's dissemination and communication activities. The public webpage for the project is one of the main communication channels of the project that has been identified in D10.2.

1.4. Structure of the document

The document is structured as follows: Section 2 provides a general overview of the design of the webpage together with the technical implementation. It also discussed the content of each individual subpage that is available on the project website.

2. Structure and subpages of the project website

As a central communication channel of the project, the website is designed to be visually appealing and to provide an overview of the main project goals and achievements to a broad range of visitors. The layout is thus vertically divided into a header (c.f. Figure 1) containing the project logo and the website menu at the top which is followed by the main content of the individual subpages and footer (c.f. Figure 2) containing the description of the project and important links at the bottom of the page. The header and the footer are on a dark blue background following the color scheme of the project logo and the main content is displayed on white background. With this choice of contrasting background colors, visitors are able to easily distinguish the content from the menu and the footer.

Figure 1 - Website header with the project logo and the website menu

The subpages are divided into the landing page, project news, project overview, results and a contact page. These subpages are discussed in more detailed in the following sections.

The footer contains a short description of the project ("About QCI-CAT"). This section is accompanied with hyperlinks to the imprint hosted on AIT's main web page,[1] which also applies to the QCI-CAT website since it is hosted by AIT, as well as the privacy note on the processing of personal data, and the contact form. Furthermore, links to all social media accounts by the project are also provided there. Finally, acknowledgement for the funding from the DIGITAL-2021-QCI-01 Digital European Program and the national co-funding from Nationalstiftung Forschung, Technologie und Entwicklung is also included.

Figure 2 - Website footer with an "About QCI-CAT" section, important links and the funding acknowledgement.

[1] https://www.ait.ac.at/en/imprint

2.1. Landing Page

The landing page (homepage) of the webpage serves as the first entry point to visitors of the QCI-CAT website. Hence it is important to provide a short and easy to understand overview of project goals, together with some key facts on this page. The structure of the landing page is thus as follows: first, the main objectives of the project are discussed (c.f. Figure 4). Afterwards, the landing page provides an overview of the use cases (c.f. Figure 4) and some key facts on the deployment of the national EuroQCI network in Austria (c.f. Figure 5). Finally, the page lists the logos of all partners of QCI-CAT (c.f. Figure 5). The page thus provides the key facts to the visitors. Following the links placed on the landing page, the visitors are provided with more detailed information on the project.

Figure 3 - Landing Page (1/3) with headline

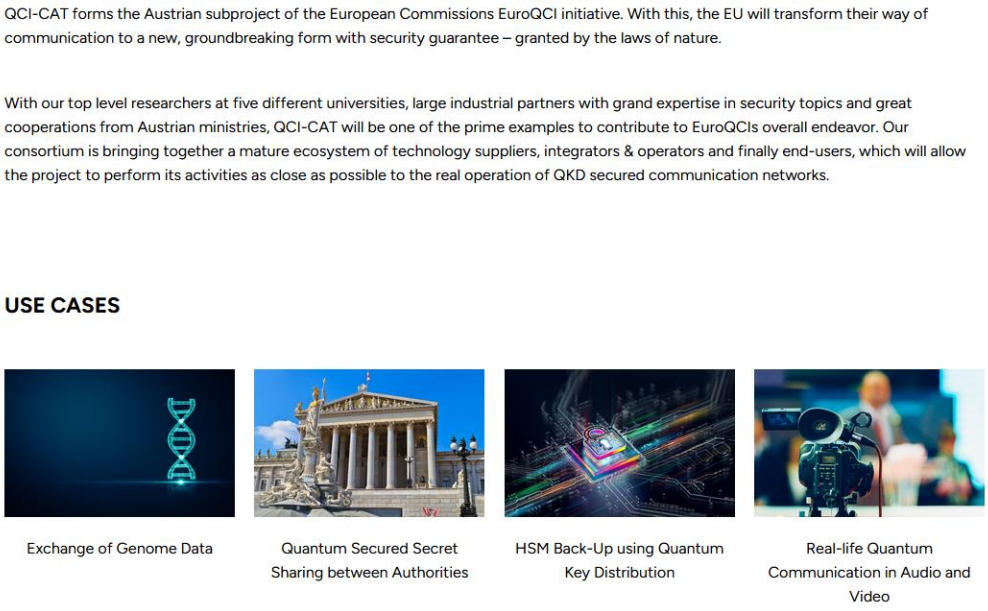


Figure 4 - Landing Page (2/3) with a short description of the project and a representation of the use cases

Figure 5 - Landing Page (3/3) with key facts and a selection of the partner logos. The partner logos are rotating to display all logos over some time frame.

2.2. News

The “News” page provides visitors with the latest project related news and also with upcoming events. The purpose this section is to give an overview of the project progress and to raise interest of project related events. The news entries are thus categorized as follows:

- **"Project News"** is a continuous display of news related to the project to highlight the achievements of the project.
- **"Events"** lists upcoming events that are planned as part of the project with all relevant information (location, participating partners, date, brief description, organizer, and a link if available). Furthermore, events within the scope of the project's topic are also listed under this section.

For both categories all entries get a dedicated page whereas the “Project News” and “Events” page list all entries with a picture, header, and short description. A sample of the overview of “Project News” is provided in Figure 6 and a sample news entry is depicted in Figure 7.

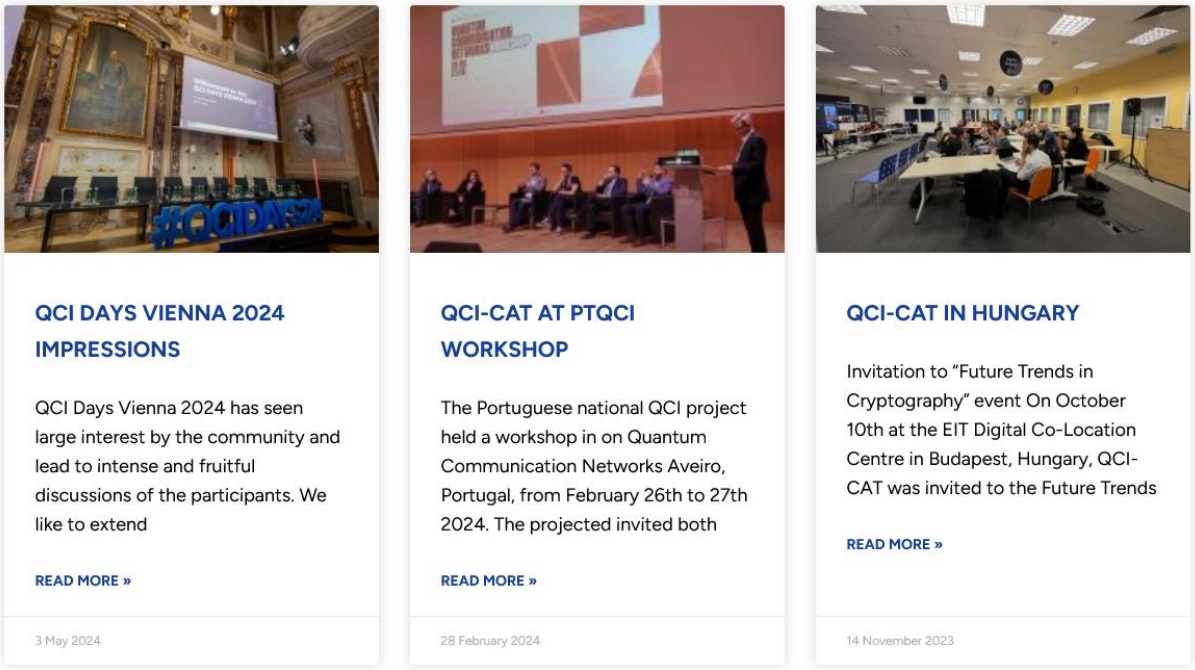
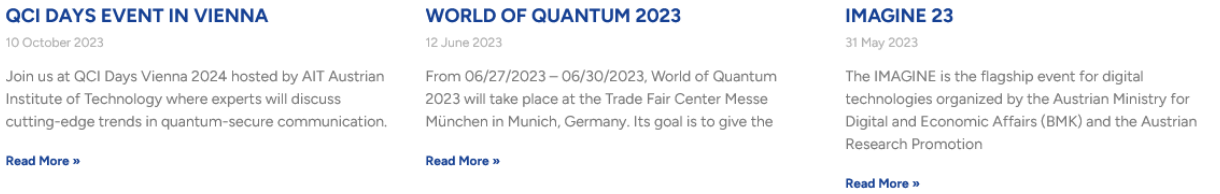


Figure 6 - Listing of news entries on the "Project News" page.

Figure 7 - Sample news entry with the headline and the introduction.

For the “Events” category, the structure is similar. The overview page provides a listing of all events (c.f. Figure 8) whereas detailed information can be found on dedicated pages (c.f. Figure 9).



QCI DAYS EVENT IN VIENNA
10 October 2023
Join us at QCI Days Vienna 2024 hosted by AIT Austrian Institute of Technology where experts will discuss cutting-edge trends in quantum-secure communication.
Read More »

WORLD OF QUANTUM 2023
12 June 2023
From 06/27/2023 – 06/30/2023, World of Quantum 2023 will take place at the Trade Fair Center Messe München in Munich, Germany. Its goal is to give the
Read More »

IMAGINE 23
31 May 2023
The IMAGINE is the flagship event for digital technologies organized by the Austrian Ministry for Digital and Economic Affairs (BMK) and the Austrian Research Promotion
Read More »

Figure 8 - List of events on the "Events" page.

June 12, 2023

WORLD OF QUANTUM 2023

From 06/27/2023 – 06/30/2023, *World of Quantum 2023* will take place at the *Trade Fair Center Messe München* in Munich, Germany. Its goal is to give the quantum community a plattform in order to exchange knowledge, to interconnect with their international collegues and to broaden the European quantum network. An elaborate agenda covering numerous topic of quantum information and quantum communication with namely speacher from politics, science and economy is being provided.

QCI-CAT consortium members together with other AIT quantum collegues will attend this meeting together with the Austrian Federal Ministry for Climate Action (BMK), in order to represent the Austrian developments within this field and to promote the QCI-CAT project internationally.

We are very much looking forward to meeting you there.

For further information, please visit the World of Quantum 2023 website.

WORLD OF QUANTUM

Figure 9 - Sample "Events" entry for the World of Quantum 2023.

2.3. Overview

The “Overview” submenu is the entry point to information on the project objectives, partners and use cases. When first entering this section of the website, visitors will be directed to the “Objectives” pages. We discuss the three subpages in the following sections.

2.3.1. Objectives

The goal of the “Objectives” subpage is to give the visitor a high-level overview of the four main objectives of the project. The description of the objectives is aimed to be understandable by a broad range of visitors without requiring in-depth knowledge about quantum-safe technologies. Visually, the objectives together with a description are presented in a „Z shape“ [2] as it is a layout pattern that follows the typical reading pattern of users and thus provides benefits in terms of readability. This layout consists of a constant vertical interchange of text and pictures or figures with each entry. Each objective is accompanied with a descriptive short text as well as a fitting picture.

Figure 10 - Header and two of the objectives as displayed on the "Objectives" page.

2.3.2. Partners

Apart from the logos of all partners on the landing page, the "Partners" displays the logos with a short description and links to the web presences of all partners. The page divides the partners based on the categories project coordinator, academic partners, industries and federal ministries (c.f. Figure 11).

PROJECT LEAD

AIT Austrian Institute of Technology (AIT) is Austria's largest research and technology organization. The institute takes a leading position in the Austrian innovation system and a key role in Europe. With its expertise of handling large EU quantum communication projects such as OPENQKD, AIT will coordinate QCI-CAT from an administrative point, as well as act as the technical manager and project lead.

INDUSTRIES

Today, CANCOM Austria AG is Austria's number 1 digitalization partner and develops new end-to-end business models in close cooperation with customers. With access to the technologies utilized in this project, CANCOM wants to widen its portfolio and grant customers the possibility to use high security transmission with quantum cryptography technology.

dacoso GmbH is a leading IT service provider in the DACH region and brings network performance and data security to the business customers with a focus on managing services for optical networks, intelligent networks and cyber security. For the project, dacoso will support with the security assessment, EuroQCI architecture, procurement and the installation/provisioning.

Figure 11 - Subset of the partner descriptions and their categorization on the "Partners" page.

2.3.3. Use Cases

The "Use Cases" subpage depicts all use cases of QCI-CAT to give the visitor an overview of the different application areas that the project is addressing. For all use cases, a representative figure and a short one to two sentence description of the use cases (cf. **Fehler! Verweisquelle konnte nicht gefunden werden.**). A link is provided for the visitors to read up on more details of the individual use cases.

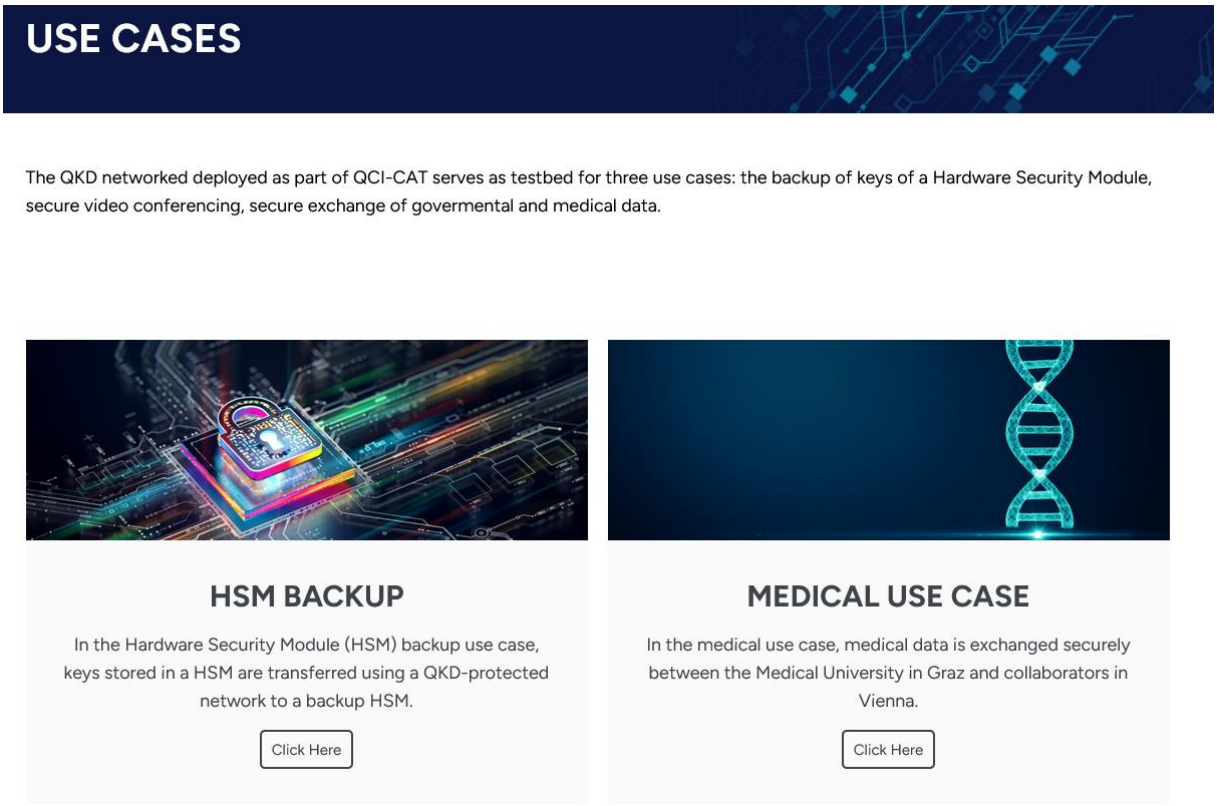
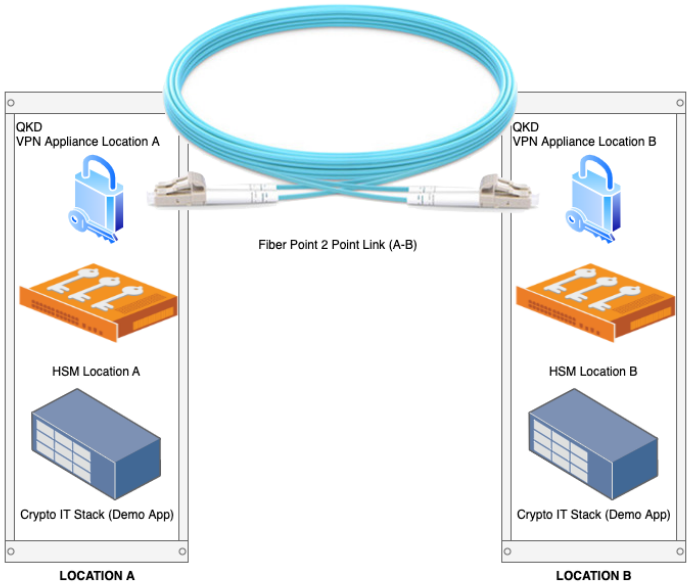


Figure 12 - Overview of the use cases on the "Use Cases" page

The pages for the individual use case – for an example see Figure 13 – discuss the goals, the network and functional architecture, and the implementation plan among others. As the implementation of the use cases progresses, the corresponding pages are updated with the adapted architectures, network and implementation plans.

This implementation involves securely transfer cryptographic material from a Hardware Security Module (HSM) to a backup HSM via a Virtual Private Network (VPN) data link that safeguards the transfer with Quantum Key Distribution (QKD) adding an unbreakable encryption layer. This ensures redundancy in case of a primary site failure.



The use case expectations center on showcasing the seamless integration of Quantum Key Distribution (QKD) and the ETSI 014 protocol within conventional Virtual Private Networks (VPN) and encryption frameworks. This integration aims to leverage the principles of quantum physics to ensure both, the confidentiality and integrity of sensitive data. The demonstration seeks to highlight the synergistic relationship between advanced quantum cryptography and established encryption protocols, emphasizing their combined strength in safeguarding data transmission.

Figure 13 - A subsection of the "HSM Backup using QKD" Use Case page.

2.4. Results

The final section of the page is dedicated to the results of the project that are achieved during the project runtime. As such, it provides all public deliverables, details on scientific and non-scientific publications in relation to the project and other publicly disclosable results.

2.4.1. Deliverables

The “Deliverables” page (c.f. Figure 14) provides a list of all public deliverables as well as download links once they are ready. During the project runtime, all public deliverables will be made available as they are accepted by European Commission and the expert reviewers. Whenever a public deliverable is posted on the website, a corresponding news entry will announce its availability to a wider audience.

All public deliverables that are produced as part of the work on QCI-CAT will be made available for download here. Deliverable downloads will be added after the deliverables have been accepted by the European Commission.

The public deliverables are as follows:

- D4.2: QKD system comparison
- D6.1: Report on HSM key-wrapping via QKD based VPN
- D7.1: Report on Medical Use Case demonstration
- D7.2: Intermediary Report on Medical Use Case Demonstration
- D8.1: Prototype of the UIBK Quantum Repater
- D8.2: AIT-DV QKD System
- D8.3: PQC-hardened Key Management Systems for QKD
- D9.1: Online platform for training of users and engineers in quantum communication
- D9.2: Pilot training period for public and private stakeholders
- D10.1: QCI-CAT webpage
- D10.2: Dissemination, communication and exploitation plan
- D10.3: National EuroQCI workshop
- D10.4: Report on communication, dissemination, end user workshops and exploitation activities

Figure 14 - "Deliverables" subpage with the list of public deliverables. Download links will be added once the deliverables have been accepted.

2.4.2. Publications

The “Publications” page serves as collection of all scientific publications in conference proceedings and journals. As such it will provide a list of all publications with a link to page providing detailed information on the publication. Furthermore, a link to both the original publication and an open access version of the publication (if the original publication is not available as open access) are provided.

The following table provides an overview of all scientific publications that were published in connection with QCI-CAT.

TITLE	AUTHORS	KEY WORDS	LINK
Muckle+: End-to-End Hybrid Authenticated Key Exchanges	Sonja Bruckner, Sebastian Ramacher, Christoph Striecks	End-to-End authenticity, Muckle+, post-quantum digital signatures, PQC, hybrid authenticated key exchange (HAKE)	Publisher, ePrint (open access)
Key Management Systems for Large-Scale Quantum Key Distribution Networks	Paul James, Stephan Laschet, Sebastian Ramacher, Luca Torresetti	Key Management System (KMS), Quantum Key Distribution Network (QKDN), PQC Hybridization, ETSI GS QKD 004	Publisher (open access)
Quantum-resistant End-to-End Secure Messaging and Email Communication	Christoph Döberl, Wolfgang Eibner, Simon Gärtner, Manuela Kos, Florian Kutschera, Sebastian Ramacher	Delta Chat, quantum-resistant cryptography, end-to-end secure messaging, PQC	Publisher (open access)

Figure 15 - List of publications with their title, authors, key words, and links to the publisher's version of the publication and an open access link (if the publisher’s version is not open access).

2.4.3. Individual results

Finally, individual results that are achieved by the project and may be of independent interest for the wider public are presented on a separate page. With this approach the results can be presented with varying levels of technical details that are deemed appropriate for the target audience. For results that are, for example, relevant for the cyber security community, a different style of presentation will be used than for results targeted at decisions makers.

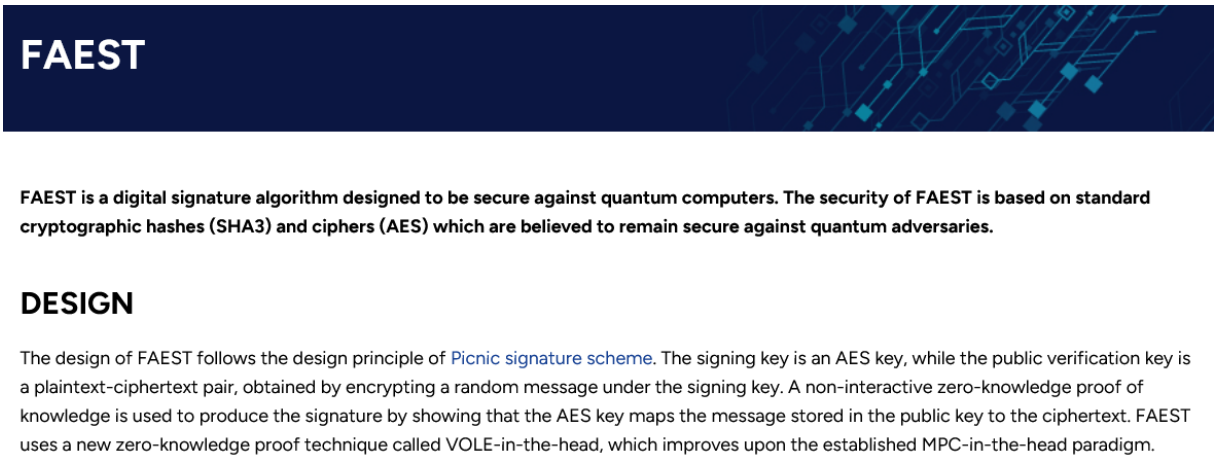


Figure 16 - Subsection of the subpage on "FAEST" which targets cryptographic experts.

2.5. Contact

The website visitor has the possibility to contact the project coordinator AIT Austrian Institute of Technology via a contact form. Technically, each inquiry created using the form provided on this page will be sent to the mail address qci-cat.admin@list.ait.ac.at which is managed by the project coordinator. The form (c.f. Figure 17) consists of a field to enter a name, an e-mail address, optional the associated organization, and a short message. Additionally, the address of the project coordinator and the administrative e-mail address of the project is shown.

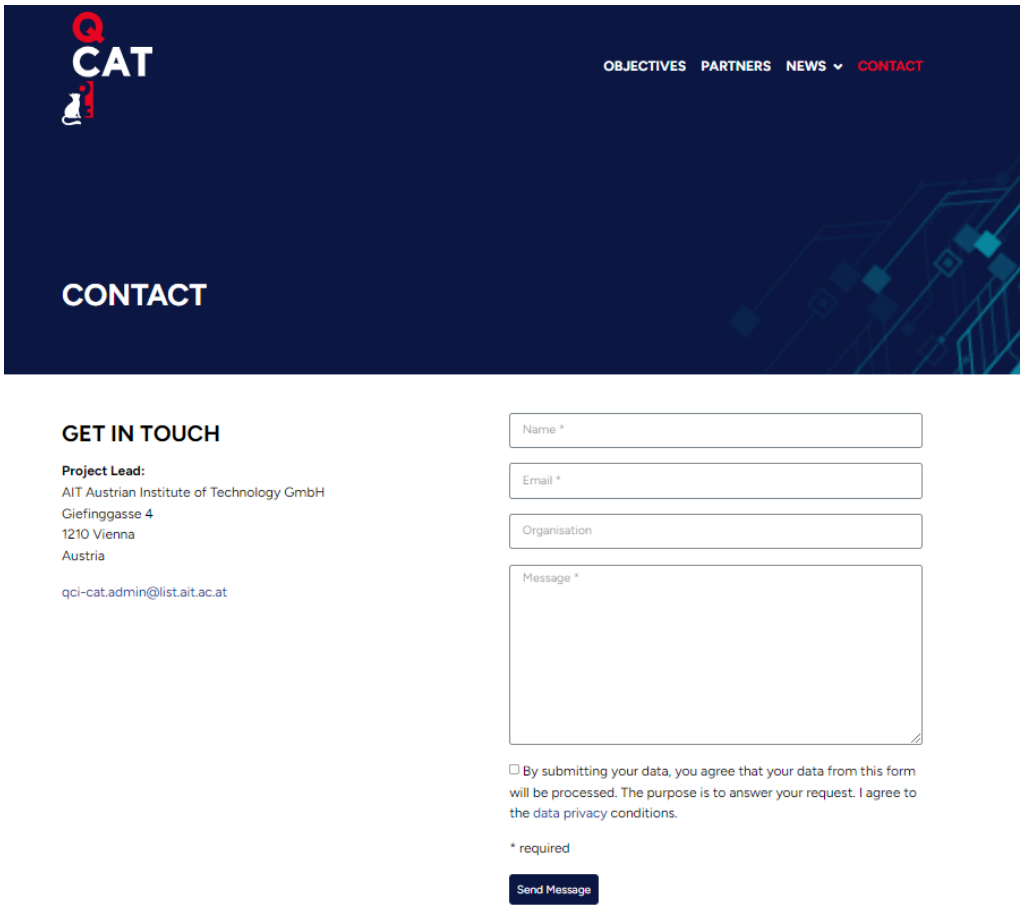


Figure 17 - Contact Page

2.6. Privacy

As potentially personally identifiable information is processed via the contact form, legal compliance requires the visitor to be informed about information on the data processing and the user's rights. A dedicated subpage – "Privacy" – provides this information and is linked from the footer of the website. It contains information about the website's host (the project coordinator AIT Austrian Institute of Technology), its contact information such as an email address, a telephone number and a mail address. Furthermore, it declares the legal basis for the processing and storage period of personal data. It also provides the necessary disclaimers of the linked social media accounts.

3. Technical Implementation

From technical perspective, the website is hosted using the WordPress[2] content management system (CMS) version 6.5.3 and is built using the Elementor Pro[3] plugin. This plugin offers a "what you see is what you get" (WYSIWYG) no-code development experience with a drag-and-drop interface to create custom layouts and functionality. The WordPress instance is hosted on a webserver running Ubuntu[4] 20.04 LTS Focal Fossa with Apache server version 2.4.41[5]. The webserver hosting the website enforces secure

[2] https://wordpress.com
[3] https://elementor.com/academy/getting-started-pro/
[4] https://releases.ubuntu.com/focal/
[5] https://httpd.apache.org/

communication via the Transport Layer Security (TLS) protocol version 1.2[6] or newer whereas the certificates are obtained via Let's Encrypt[7].

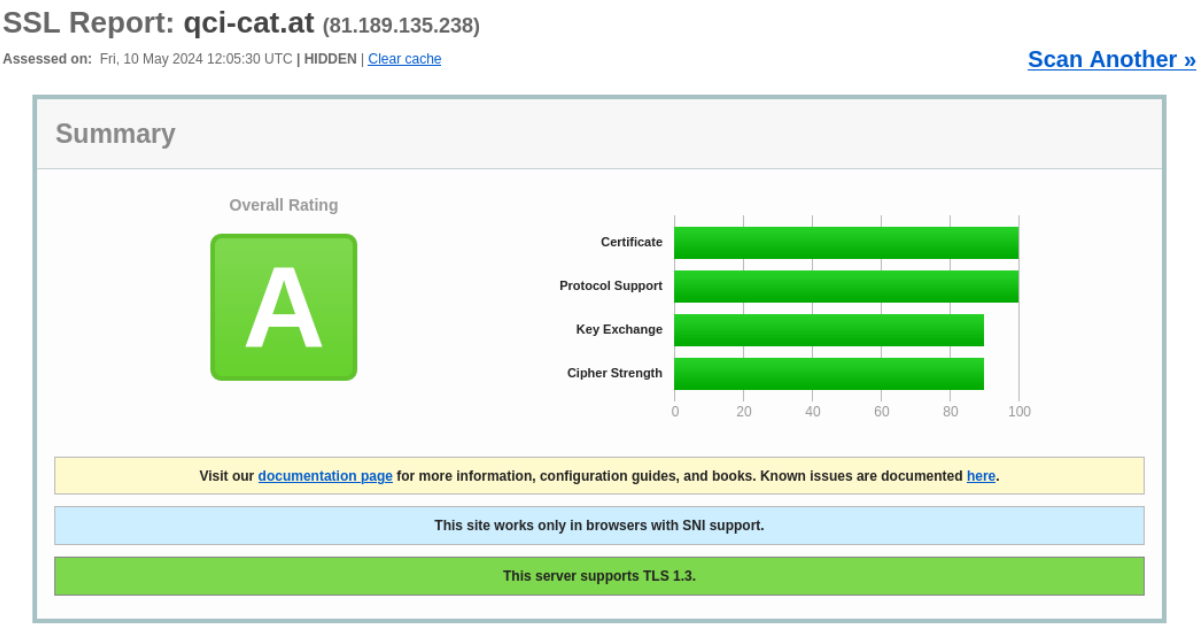
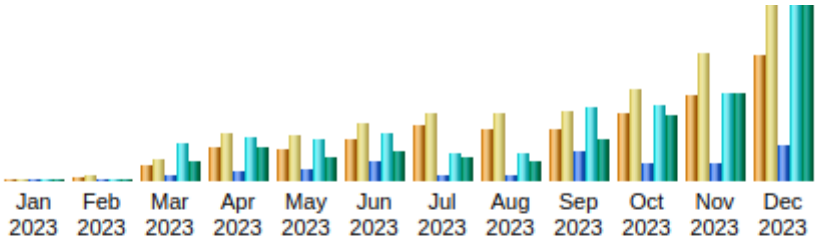


Figure 18 - Report on the TLS connection offered by the webserver from Qualsys' SSL Labs.

To follow best practices, security updates are installed and applied by the IT department from AIT Austrian Institute of Technology. These updates are applied for all software components involved in serving the website - from the webserver software to WordPress and its plugins.

Finally, to monitor the reach of the website, user statistics are collected using AWStats[8] (c.f. Figure 19). The web analytics software is hosted locally at AIT to avoid the usage of cloud-based trackers and to limit the sharing of personal data with third parties.

[6] https://www.rfc-editor.org/rfc/rfc5246
[7] https://letsencrypt.org/
[8] https://awstats.org



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2023	6	7	9	9	2.28 KB
Feb 2023	42	51	52	52	12.90 KB
Mar 2023	162	220	1,971	12,828	239.75 MB
Apr 2023	353	503	3,183	15,147	418.02 MB
May 2023	329	474	3,881	14,351	293.75 MB
Jun 2023	427	603	6,412	16,628	368.32 MB
Jul 2023	585	708	1,879	9,626	285.31 MB
Aug 2023	544	720	1,938	9,298	247.24 MB
Sep 2023	541	740	10,273	26,211	513.20 MB
Oct 2023	709	974	6,067	26,575	806.65 MB
Nov 2023	902	1,344	6,024	30,669	1.05 GB
Dec 2023	1,323	1,911	12,306	63,830	2.19 GB
Total	5,923	8,255	53,995	225,224	6.34 GB

Figure 19 - Monthly visitor statistics for qci-cat.at in 2023.

Summary

The QCI-CAT website is one of the main communication channels of the project with the potential to reach the general public, stakeholders, decision makers, academia, and many more. Hence the website is aimed to provide an overview of the goals and use cases of the project on a visually appealing and easily navigate-able website. Beyond the goals of the project, visitors are also informed on project results including publications and are provided with download links to the public deliverables of the document. With the possibility to also inform about all project related activities, the website fulfils its purpose in line with the dissemination and communication plan [1].

Appendix A - List of Acronyms

- CMS: Content Management System
- LTS: Long term support
- QCI: Quantum Communication Infrastructure
- QCI-CAT: QCI: Proof of Concept – Secure Connectivity Austria
- TLS: Transport Layer Security
- WYSIWYG: what you see is what you get

Appendix B – Bibliography

[1] QCI-CAT Consortium, "D10.2: Dissemination, communication and exploitation plan," 2023.

[2] S. Bradley, "3 Design Layouts: Gutenberg Diagram, Z-Pattern, And F-Pattern," vanseo design, 2021. [Online]. Available: https://vanseodesign.com/web-design/3-design-layouts/.