EU-SEC
Continuous Auditing-based Certification

Training & Awareness Slide Set

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

Introduction to EU-SEC

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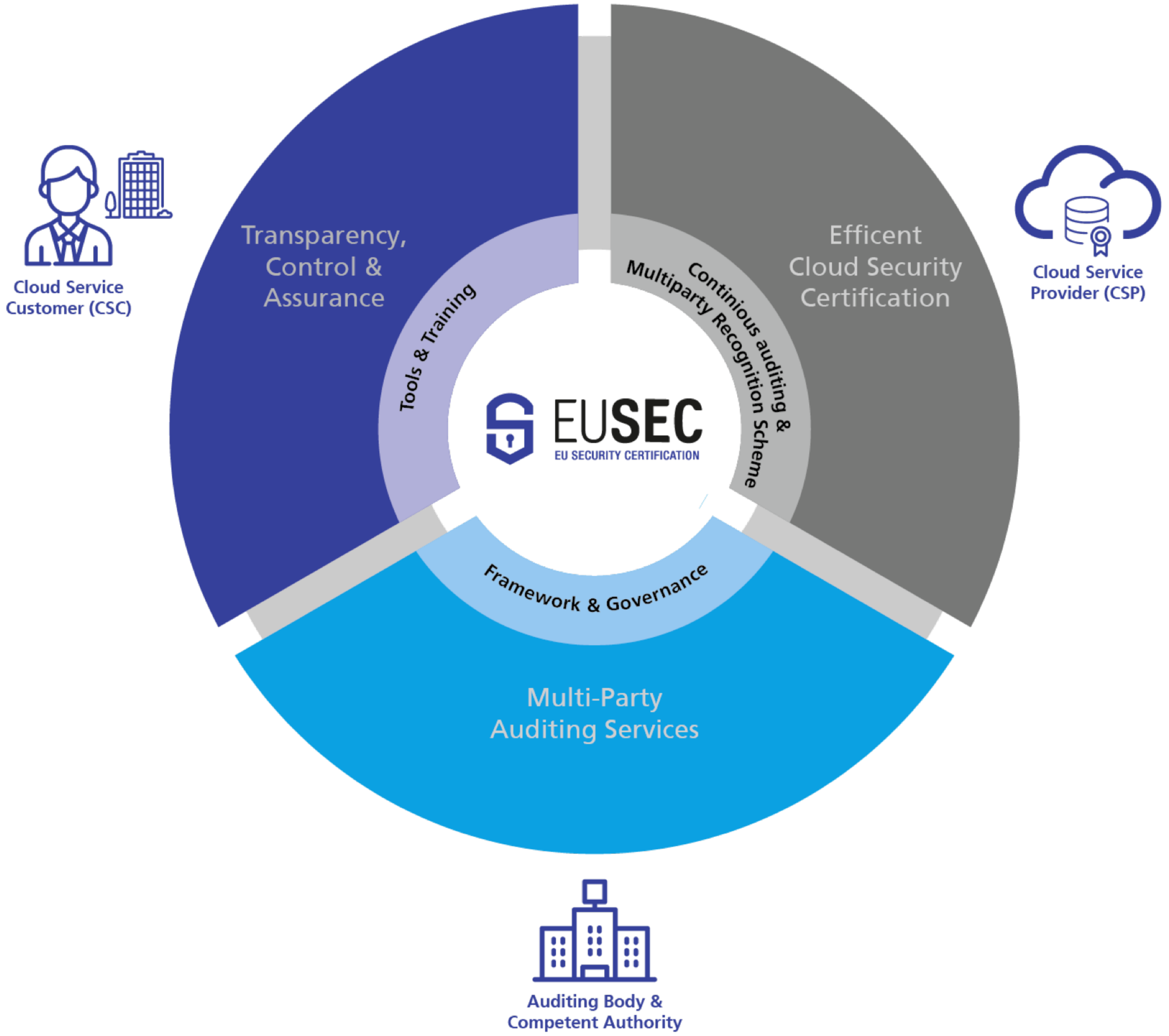
Trust in Cloud by Certification

The European Security Certification Framework (EU-SEC)

EU-SEC aims to create a framework under which existing certification and assurance approaches can co-exist. It has a goal to improve the business value, effectiveness and efficiency of existing **cloud security certification schemes**.

- **Multiparty Recognition Framework (MPRF)** for cloud security certifications,
- **Continuous Auditing-based Certification (CAC)**
- **Privacy Code of Conduct (PLA CoC)** , and


Cloud Service Customer (CSC)
Transparency, Control & Assurance
Efficent Cloud Security Certification
Cloud Service Provider (CSP)
Tools & Training
Multiparty Recognition Scheme
Continious auditing &
EUSEC
EU SECURITY CERTIFICATION
Framework & Governance
Multi-Party Auditing Services
Auditing Body & Competent Authority

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Project Set Up and Partners

A successful cooperation under the hood of a common project

EUSEC
EU SECURITY CERTIFICATION

Funded by **EU Horizon 2020**, a funding programme created by the European Union to support and foster research in the European Research Area

9 Partners (including CSPs, Cloud Users, Auditors, Scheme Owners and Researchers)

Duration: January 2017 - December 2019

Web: https://www.sec-cert.eu/
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Twitter: @EU_SEC

CaixaBank

CSA cloud security alliance®

Fabasoft

Fraunhofer FOKUS

Fraunhofer AISEC

MINISTERSTVO FINANCIÍ SLOVENSKEJ REPUBLIKY

REPUBLIKA SLOVENIJA MINISTRSTVO ZA JAVNO UPRAVO

nixu cybersecurity.

pwc | Deutschland

sixsq

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EU-SEC Objectives
Increasing trust, efficiency and sustainability

- Increase user trust in Cloud Service Providers by
  - **defining principles, rules and processes for mutual recognition** between different certification schemes indicating security and privacy level.
  - **defining an approach for higher frequency security audits** for high security applications
- Support EU-SEC's long term sustainability by initiating the process **for the trans-European adoption of the EU-SEC framework and of the format used to express security requirements, controls and audit results.**

Photo by Noah Busher on Unsplash

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EU-SEC Achievements
Applicability, flexibility and tool support

- **Cross-industry applicability** of the EU-SEC framework.
- **High level of security and privacy assurance and control** while the CSP enhances the Cloud Service, continuously.
- Consolidated framework which can be **adapted to new technical, compliance and market requirements**, easily and promptly.
- **Flexible and functional architecture and tools** for cloud security governance, risks management and compliance.

The U.S. National Archives

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EU-SEC Activities
Define, evaluate, improve and maintain the framework

- Collect and maintain security and privacy requirements relevant to the public and private sector.
- Define the continuous auditing and certification framework and enable it for mutual recognition of existing certification and assurance approaches.
- Develop a governance structure to support trans-European EU-SEC framework adoption. Provide architecture and adapt existing tools to facilitate continuous auditing and control of security and privacy level service.
- Validate the framework with pilot use cases executed by public and private sector partners to ensure its effectiveness, efficiency and market readiness in large-scale demonstrators.
- Strengthen the value proposition, market uptake and long-term sustainability of EU-SEC framework through commercial exploitation, influencing other standardization initiatives and performing strategic awareness and training activities.

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EU-SEC Business Drivers

Value Proposition for Cloud Service Providers, Auditors and Users

- **Saving money:** MPRF reduces compliance costs
- **Increased efficiency:** MPRF streamlines the compliance approach
- **Improved security**: CACs reduces security risks (higher audit frequency, less auditors approaching your data)
- **Transparency and clarity**: One standard of reference to enable comparison and integration between many different ones
- **Up to date with most recent legislation:** EU-SEC addresses the needs of the EU-Cyber Security Act

Photo by Joshua Earle on Unsplash

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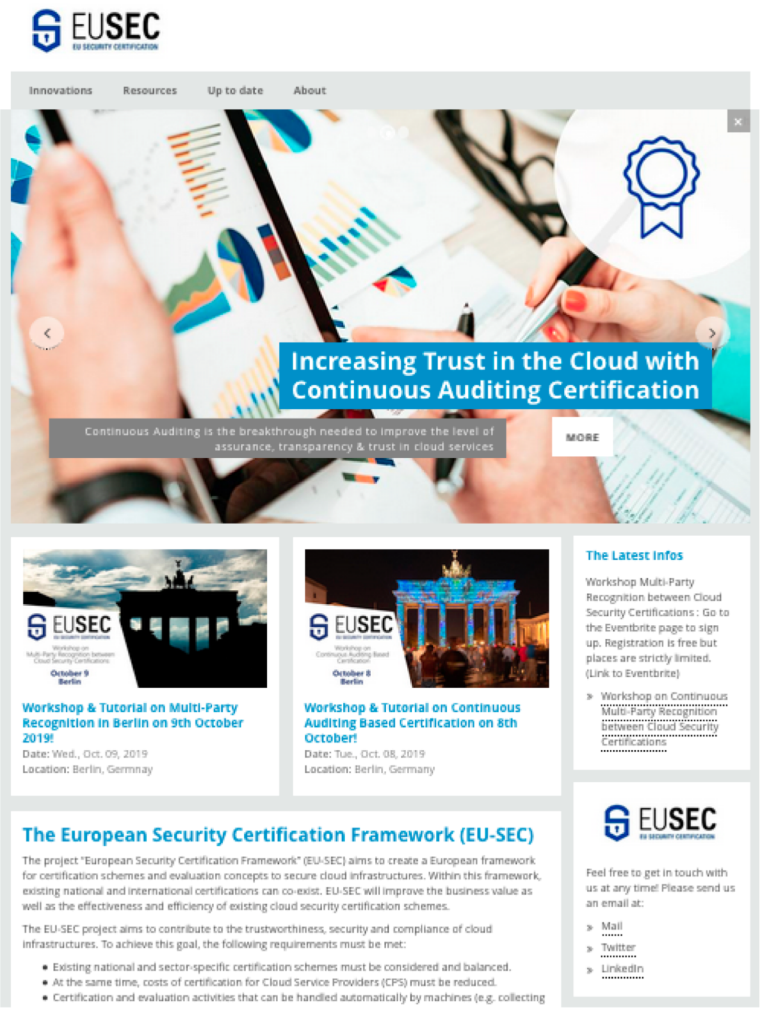
EU-SEC Public Materials
Information portal at www.wec-cert.eu


EUSEC
EU SECURITY CERTIFICATION
Innovations
Resources
Up to date
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MORE

Increasing Trust in the Cloud with Continuous Auditing Certification

Continuous Auditing is the breakthrough needed to improve the level of assurance, transparency & trust in cloud services

Workshop on Multi-Party Recognition between Cloud Security Certifications
October 9
Berlin
Workshop on Continuous Auditing Based Certification
October 8
Berlin

Workshop & Tutorial on Multi-Party Recognition in Berlin on 9th October 2019!
Date: Wed., Oct. 09, 2019
Location: Berlin, Germnay

Workshop & Tutorial on Continuous Auditing Based Certification on 8th October!
Date: Tue., Oct. 08, 2019
Location: Berlin, Germany

The Latest Infos

Workshop Multi-Party Recognition between Cloud Security Certifications : Go to the Eventbrite page to sign up. Registration is free but places are strictly limited. (Link to Eventbrite)

» Workshop on Continuous Multi-Party Recognition between Cloud Security Certifications

The European Security Certification Framework (EU-SEC)

The project "European Security Certification Framework" (EU-SEC) aims to create a European framework for certification schemes and evaluation concepts to secure cloud infrastructures. Within this framework, existing national and international certifications can co-exist. EU-SEC will improve the business value as well as the effectiveness and efficiency of existing cloud security certification schemes.

The EU-SEC project aims to contribute to the trustworthiness, security and compliance of cloud infrastructures. To achieve this goal, the following requirements must be met:

- Existing national and sector-specific certification schemes must be considered and balanced.
- At the same time, costs of certification for Cloud Service Providers (CPS) must be reduced.
- Certification and evaluation activities that can be handled automatically by machines (e.g. collecting

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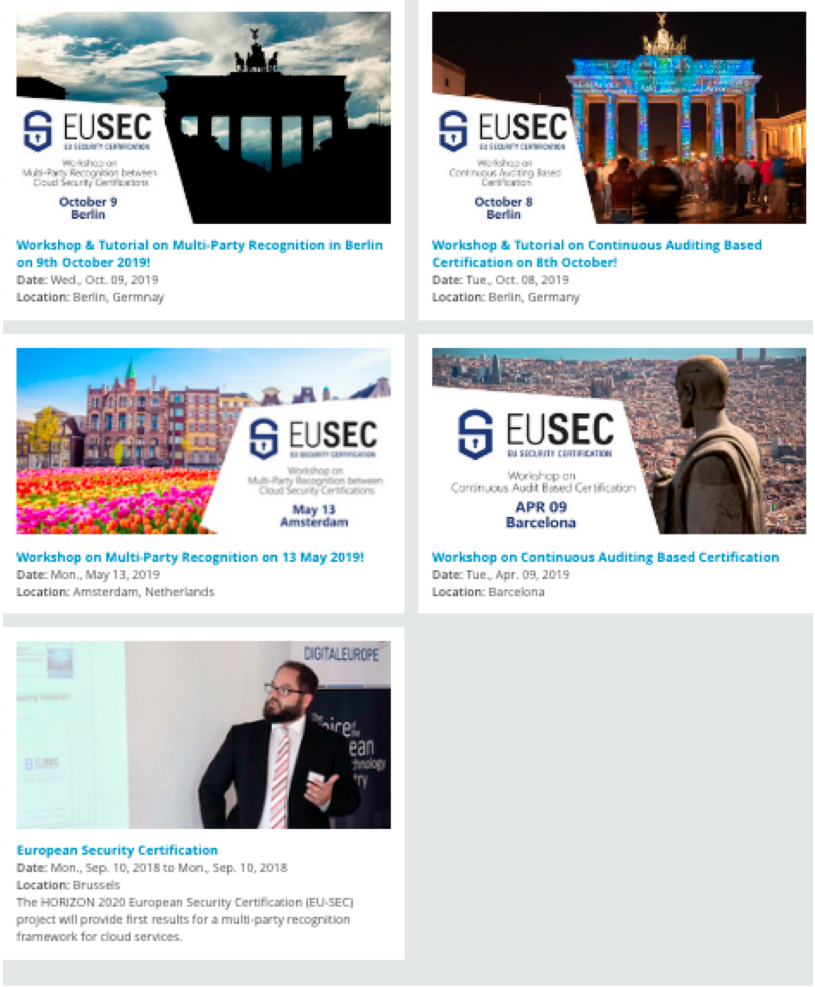
EUSEC
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Workshop on Multi-Party Recognition between Cloud Security Certifications
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May 13
Amsterdam
Workshop on Continuous Audit Based Certification
APR 09
Barcelona
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Date: Tue., Oct. 08, 2019
Location: Berlin, Germany

Workshop on Multi-Party Recognition on 13 May 2019!
Date: Mon., May 13, 2019
Location: Amsterdam, Netherlands

Workshop on Continuous Auditing Based Certification
Date: Tue., Apr. 09, 2019
Location: Barcelona

European Security Certification
Date: Mon., Sep. 10, 2018 to Mon., Sep. 10, 2018
Location: Brussels
The HORIZON 2020 European Security Certification (EU-SEC) project will provide first results for a multi-party recognition framework for cloud services.

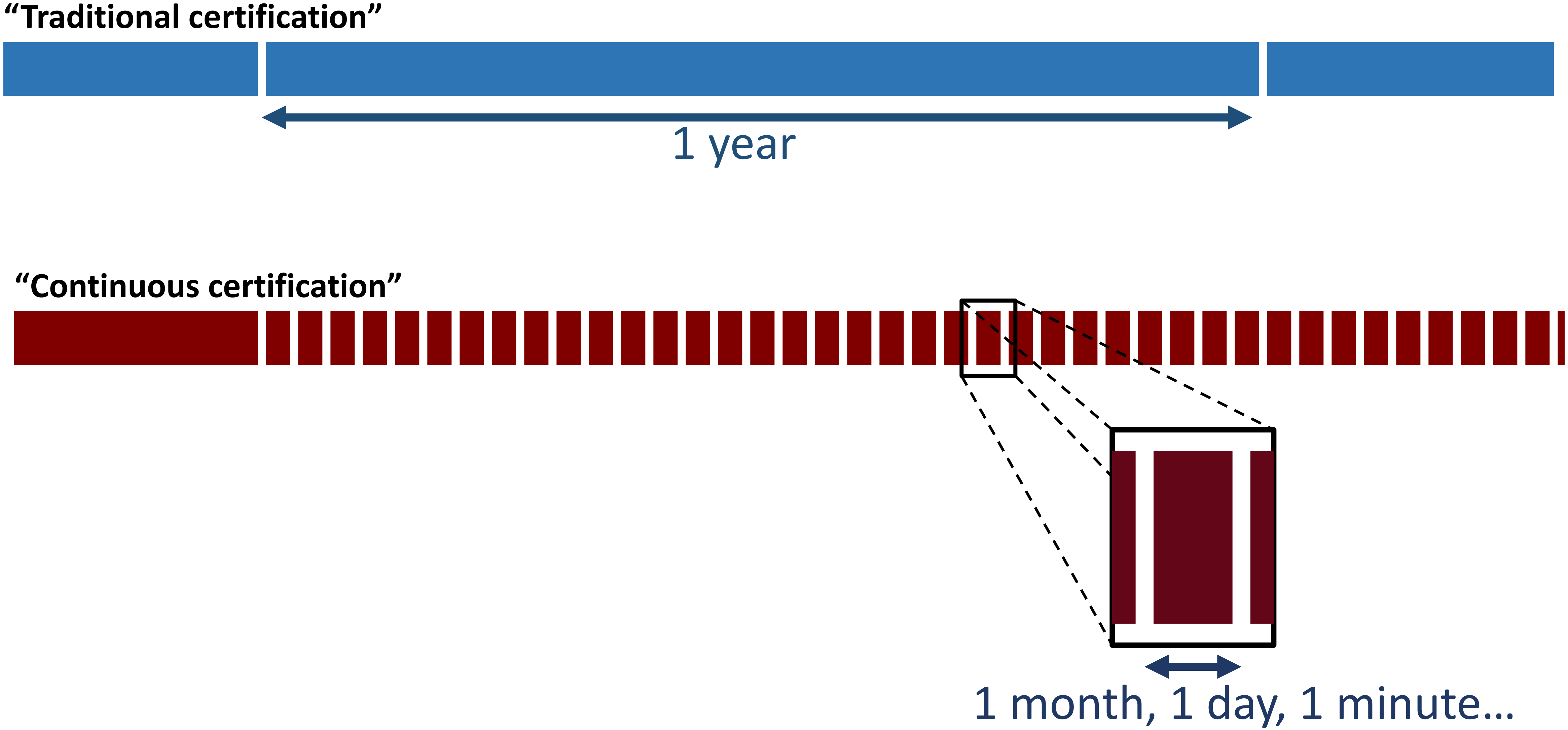
This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

Introduction to the Continuous Auditing Based Certification scheme for Cloud Services

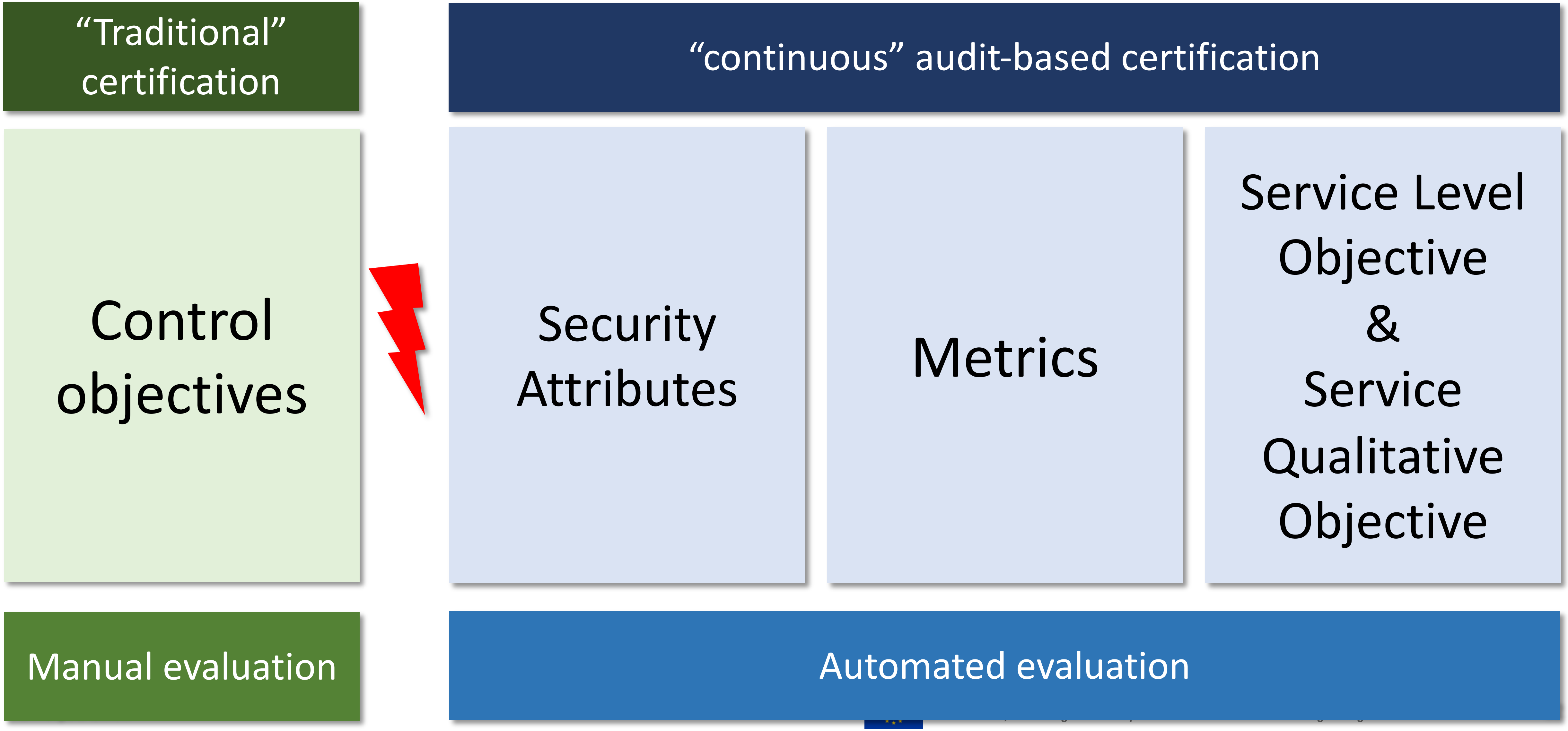
Alain Pannetrat (CSA)

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

EU-SEC introduces: continuous audit-based certification


"Traditional certification"
1 year
"Continuous certification"
1 month, 1 day, 1 minute…

“Traditional” vs. “Continuous”



“Traditional” certification

Control objectives

Manual evaluation

“continuous” audit-based certification

Security Attributes

Metrics

Service Level Objective & Service Qualitative Objective

Automated evaluation

A requirement: automate as much as possible

Traditional certification evaluates “control objectives”, continuous certification targets “service level objectives” or “service qualitative objective”, which can be assessed automatically more easily.

CONTROL OBJECTIVES

“Business continuity plans shall be documented and tested regularly”

SECURITY ATTRIBUTES

- Percentage of backup restoration tests per month
- Percentage of backup restoration failures per month
- Maximum recovery time
- Recovery point actual (RPA)

Check: Monthly, daily, hourly…

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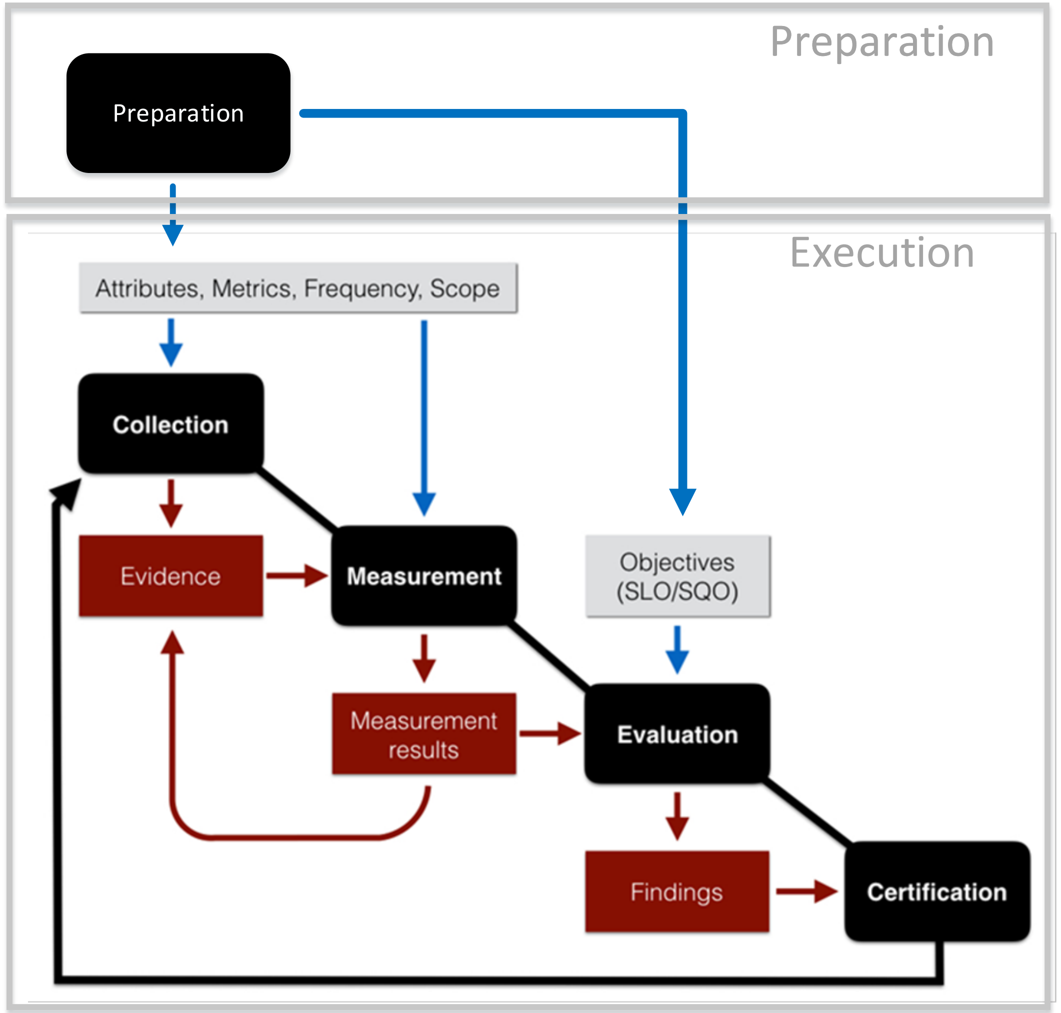
Continuous Auditing-based Certification
Methodology – phases

1. **Preparation**: mainly devoted to the operationalisation of the controls
   - This initial setup is performed once
   - SLO’s and SQO’s are defined to describe controls
   - The output are: scope, SLO/SQO and frequency of assessment.
2. **Collection**: devoted to the collection of evidence
3. **Measurement**: the metrics are applied to the collected evidence.
4. **Evaluation**: it checks if an objective is fulfilled.
5. **Certification**: according to the result of the evaluation, a certificate is granted or not.



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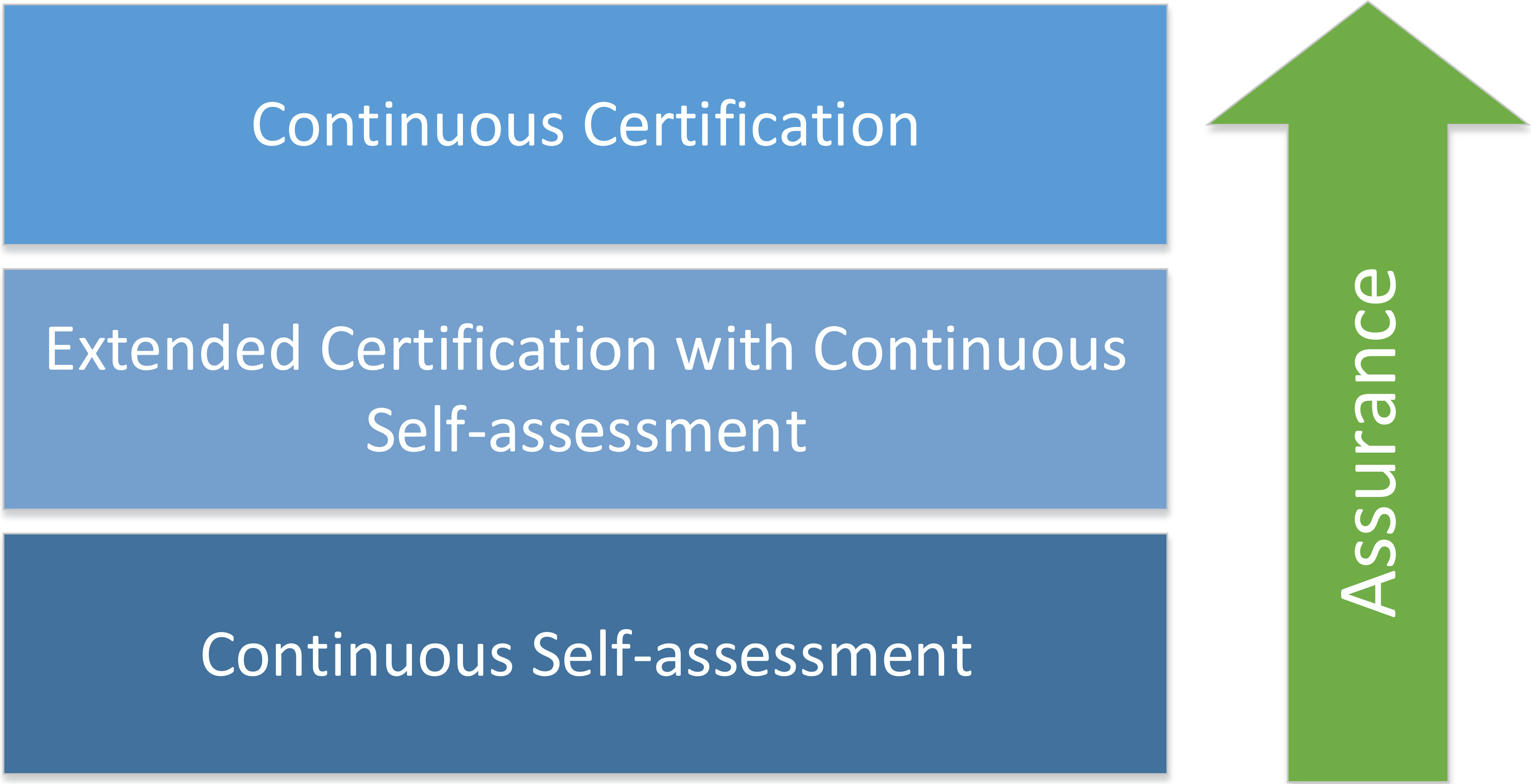
3 assurance levels



Continuous Certification

Extended Certification with Continuous Self-assessment

Continuous Self-assessment

Assurance

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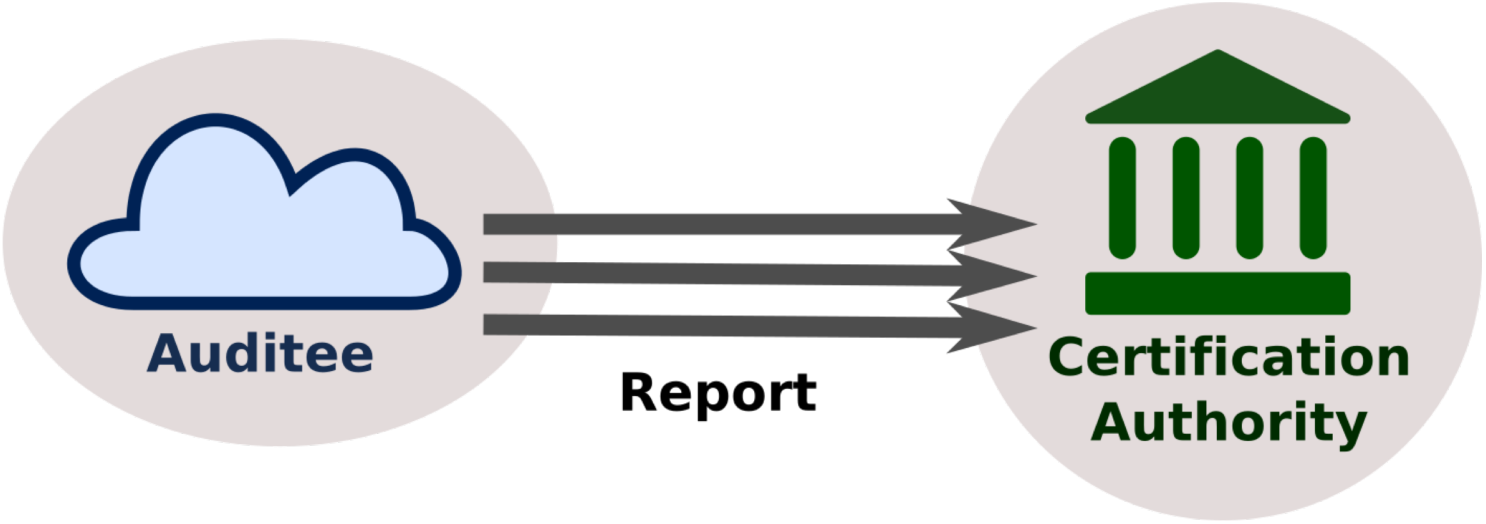
Level 1: Continuous self-assessment



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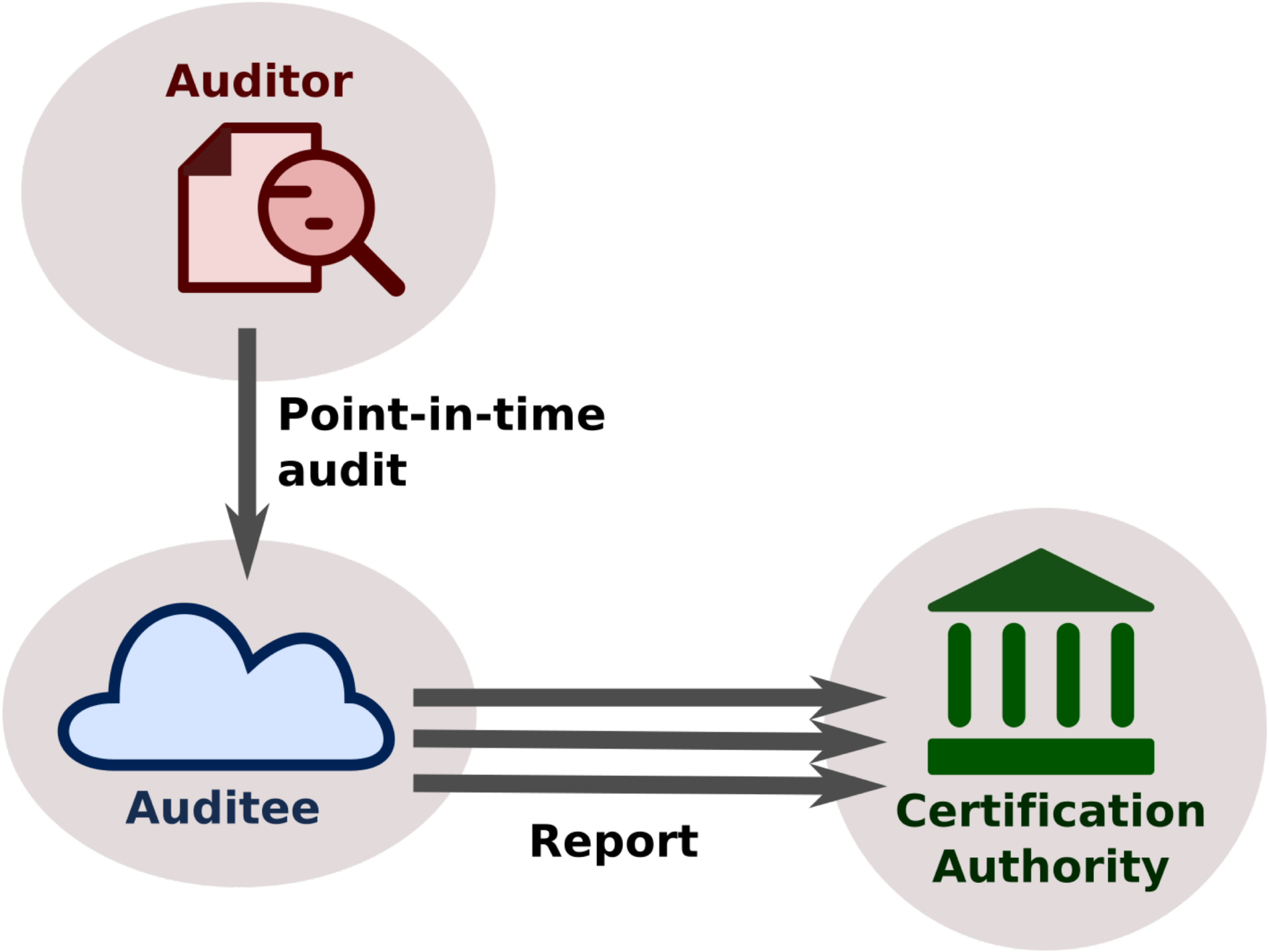
Level 2: Extended certification with continuous self-assessment



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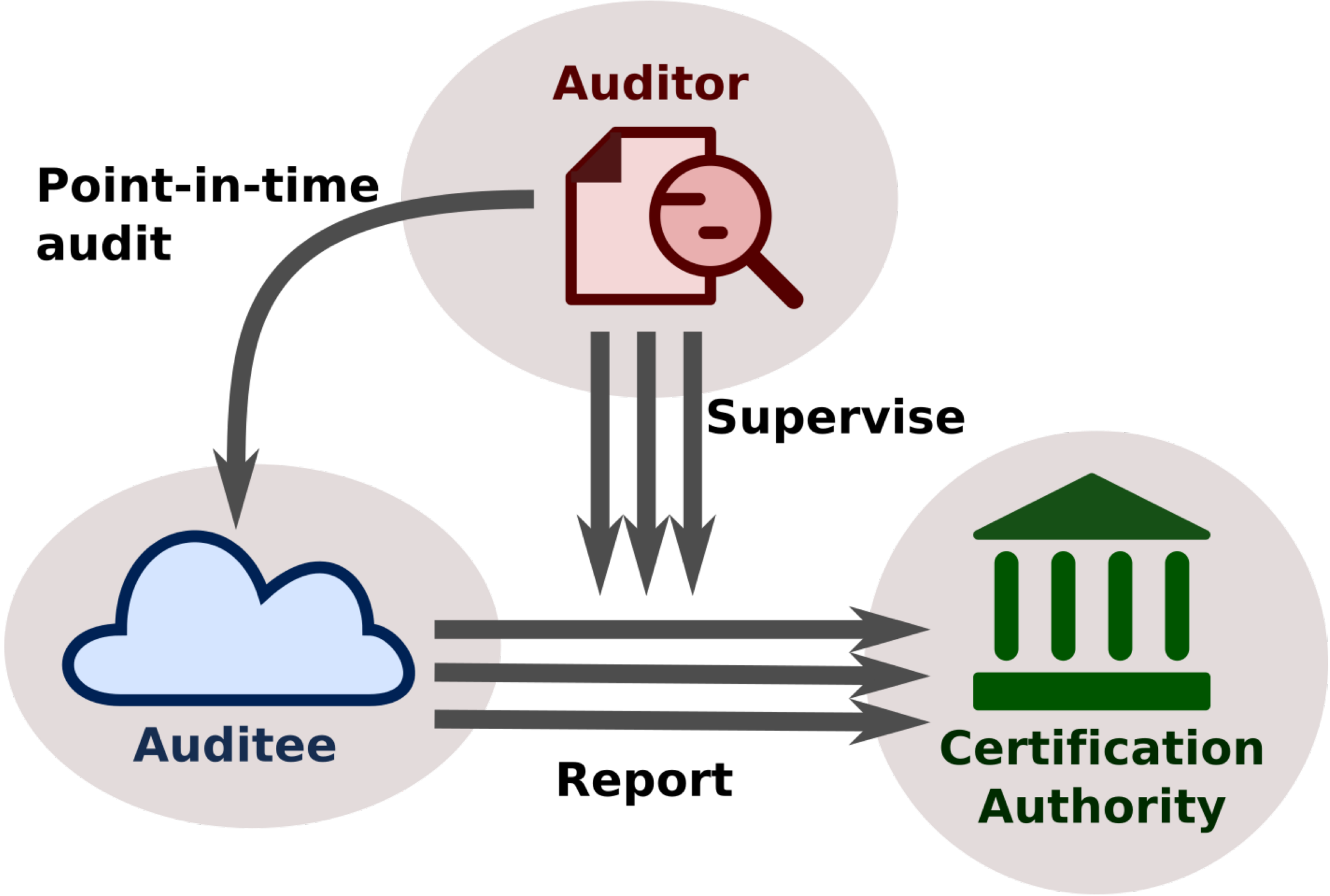
Level 3: Continuous certification



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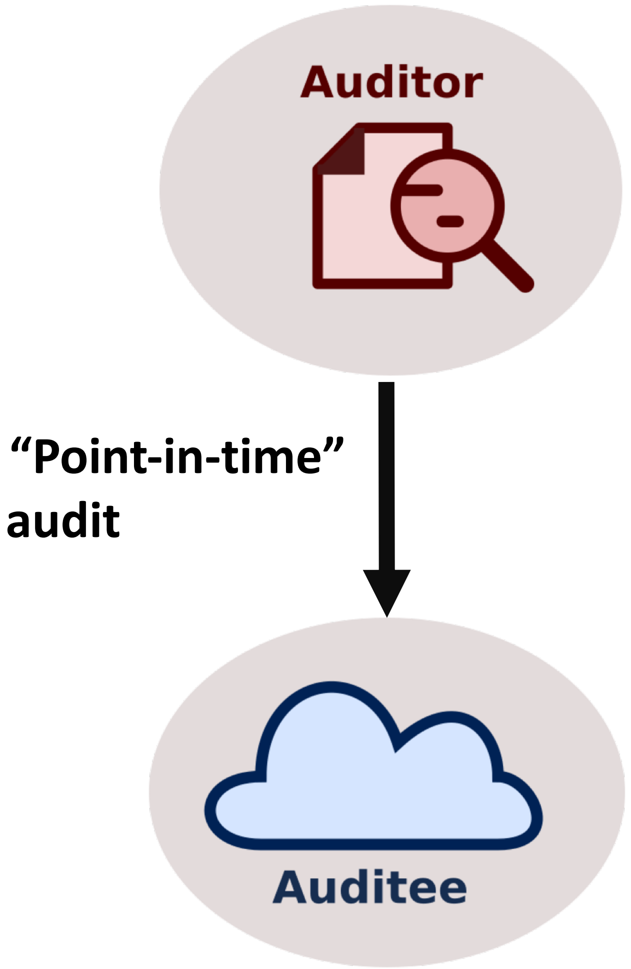
Continuous certification: preparation



Output:

- A traditional certificate
- A continuous certification target
  - Scope
  - SLO & SQO
  - Frequencies of assessment
- Audit tool validation

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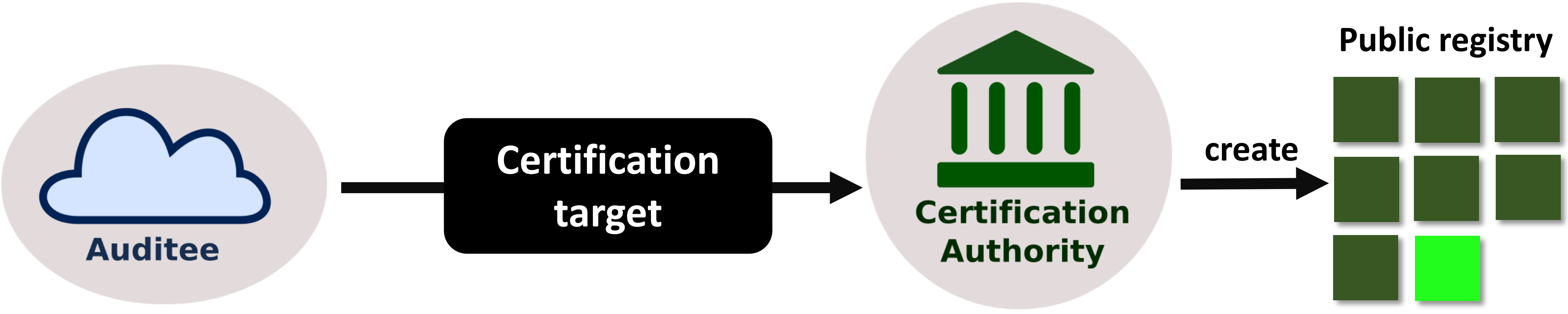
Continuous certification: initialization



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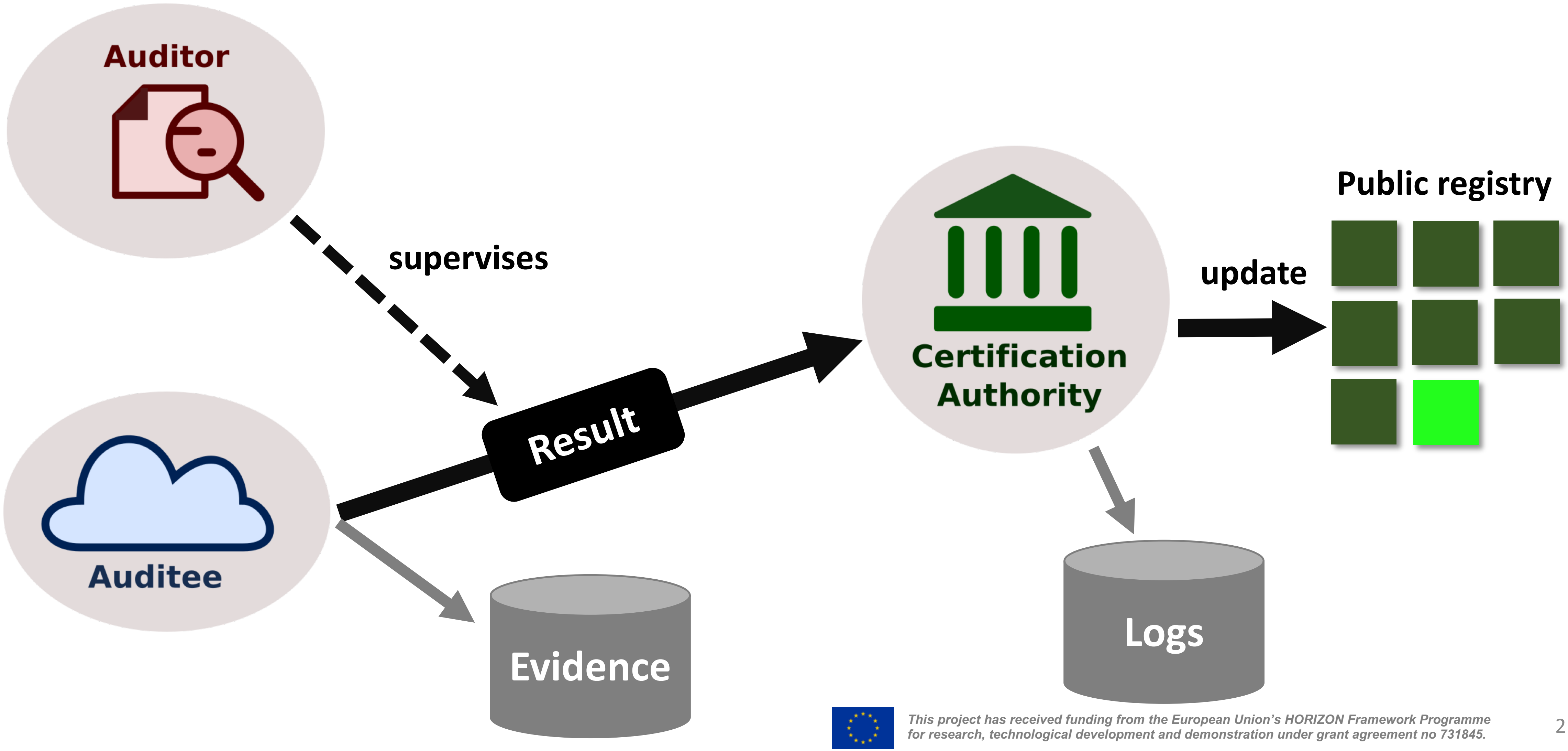
Continuous certification: continuous assessment



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The EU-SEC Continuous Auditing Based Certification pilot

Ramon Martín de Pozuelo (CAIXABANK)

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

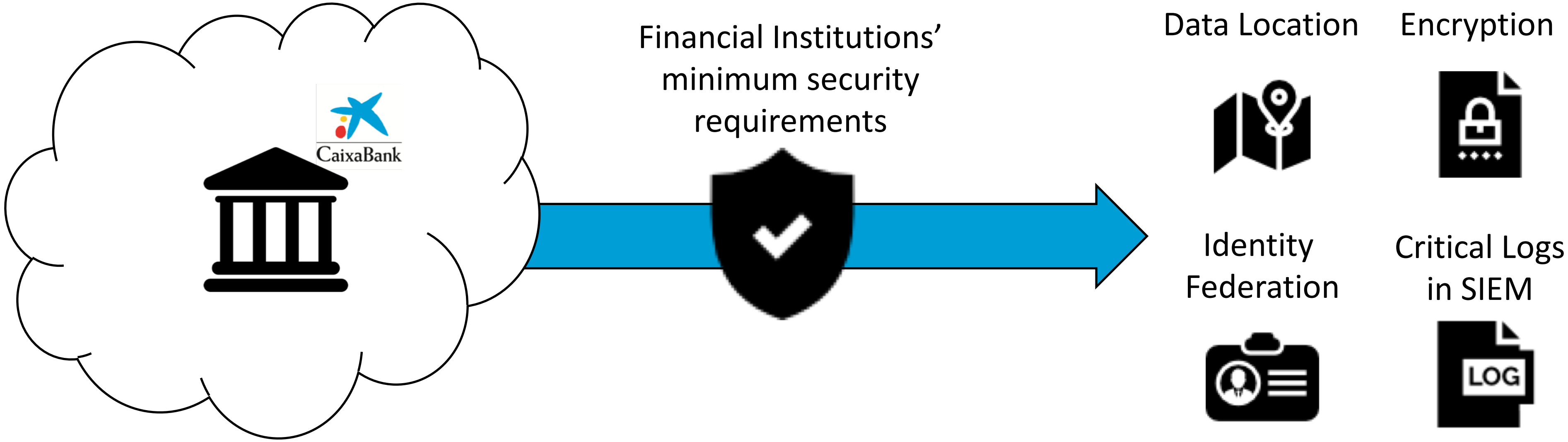
Description of the Pilot
Introduction

EUSEC EU SECURITY CERTIFICATION

Trusted information sharing — Financial institutions need to report sensible information to the regulators in a reliable and trusted way.

Collaboration — In some cases, this exchange of information can involve multiple entities and organisations.

Industrial gap motivation: Lack of a continuous auditing service that verifies that the cloud provider running the information sharing service actually complies with Financial Institutions' requirements.



Goal: Continuous auditing of security requirements in a **Financial Information SHaring (FISH)** application with EU-SEC platform.

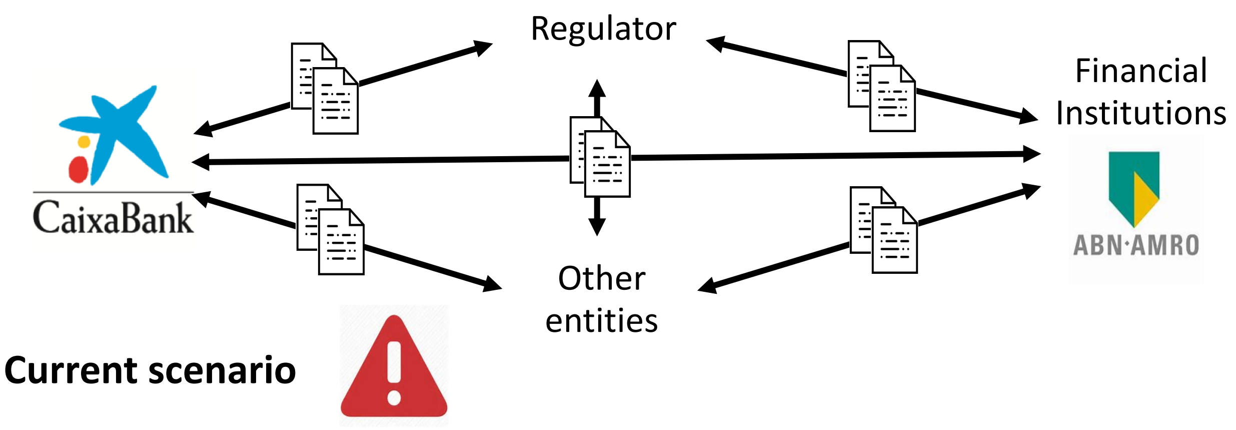
This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

Description of the Pilot
Introduction

Current scenario and problem statement:

- Regulatory entities **require banks to share information.**
- **Regulators may ask CaixaBank for confidential information** of accounts:
  - **Incident reporting** with information of mule accounts for fraud and money laundering, terrorism, etc.
  - **Periodic reports** about security and privacy projects and procedures.

- Information is **shared across groups of regulators/banks**:
  - A simple repository hosted by a bank cannot be trusted by others.
- This may lead to **bad practices and/or onerous document management**:
  - Report sensitive information via mail, physical sharing of information,…



Regulator

Financial Institutions

Other entities

CaixaBank

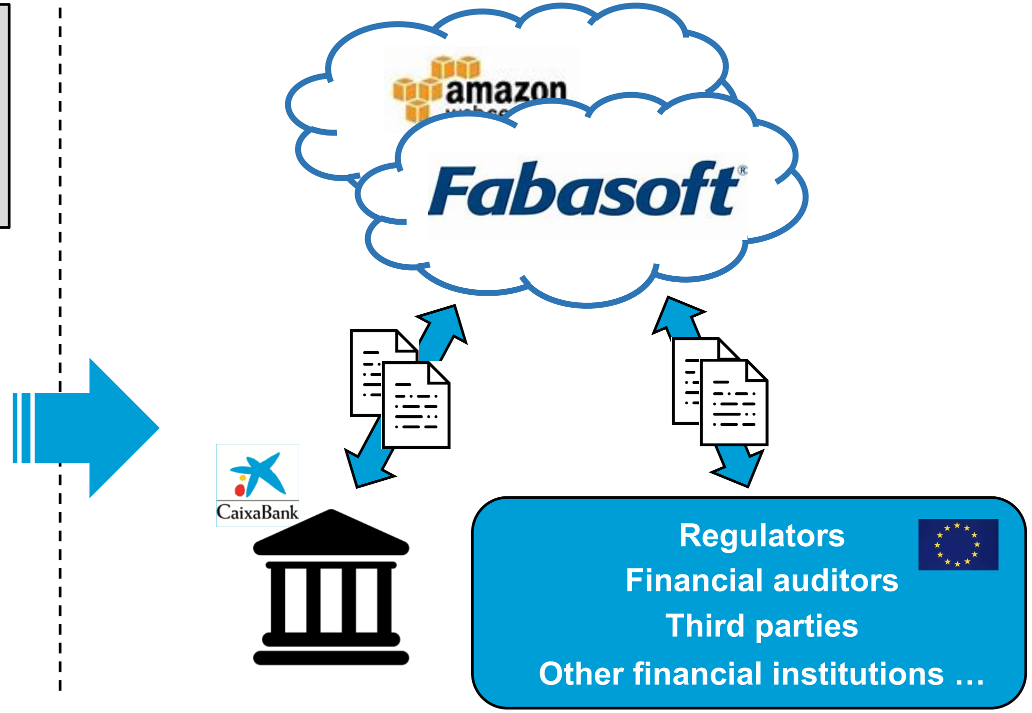
ABN·AMRO

Current scenario

FISH: Neutral European service used by both financial entities and regulators.

Pilot 2 different approaches:

- Custom-tailored FISH over commercial cloud provider (IaaS).
- Fabasoft as a cloud platform for information sharing (SaaS).



Regulators
Financial auditors
Third parties
Other financial institutions …

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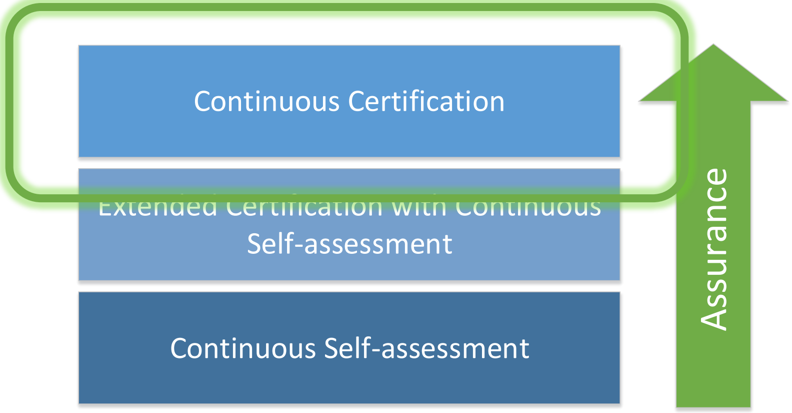
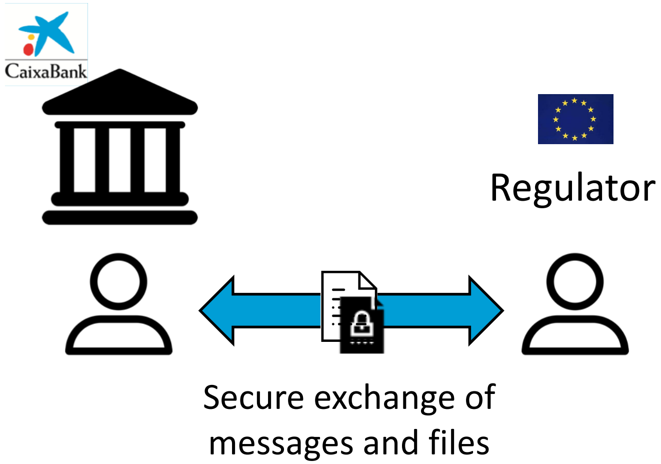
Description of the Pilot
Definition


Continuous Certification
Extended Certification with Continuous Self-assessment
Continuous Self-assessment
Assurance



EU-SEC Requirement repository

Requirements	Control	CCM code
Data location	The location of all sensitive data and its usage by applications and databases should be known. Moreover, all data should be located within European Economic Space.	CCM-GRM-02, CCM-STA-05
Encryption	All data should be encrypted both at rest and in transit. Cryptographic key management policies and procedures should be defined.	CCM-EKM-04, CCM-EKM-02
Identity Federation	Strong authentication of admin users. Access control and admin profiles should be defined.	CCM-IAM-12
Critical logs in SIEM	All monitoring and evidences logs should be stored in CaixaBank infrastructure.	CCM-IVS-01

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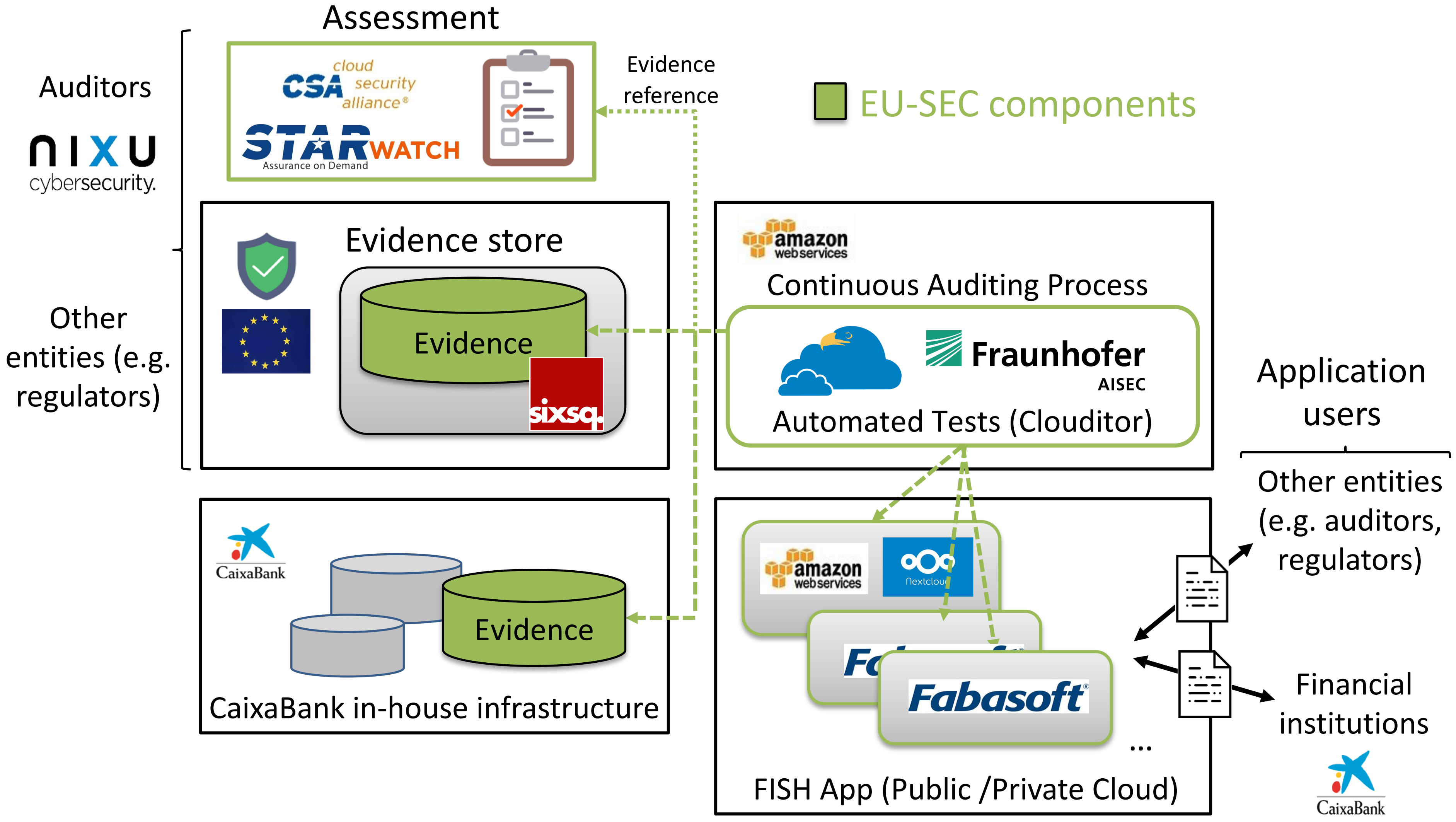
Description of the Pilot
Architecture



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Description of the Pilot
Continuous Auditing API and pilot approaches

- **Continuous Audit API**
  - **CaApiDataLocation**

    GET /{scope}/datalocation/{objectId}/storage/
  - **CaApiEncryption**

    GET /{scope}/encryption/{objectId}/
  - **CaApiIam**

    GET /{scope}/identityfederation/admins/

    POST /{scope}/identityfederation/data/access

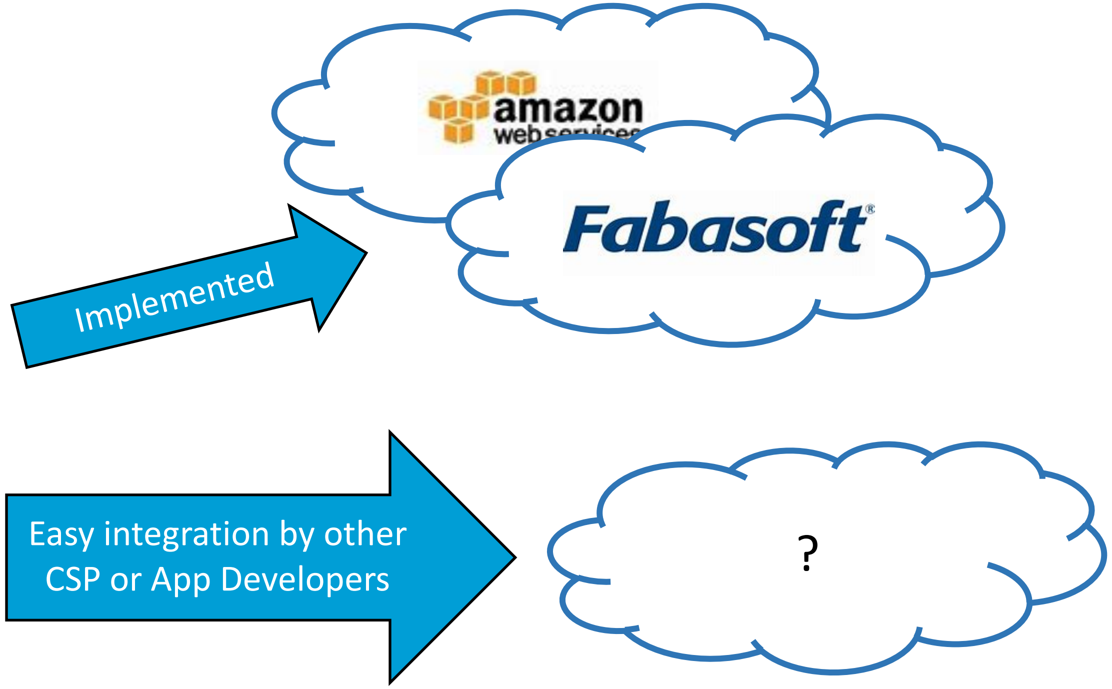
    GET /{scope}/identityfederation/{userId}/logins

    GET /{scope}/identityfederation/{userId}/auth

    GET /{scope}/identityfederation/{userId}/groups
  - **CaApiScope**

    GET /scope/

  …



Implemented

Easy integration by other CSP or App Developers

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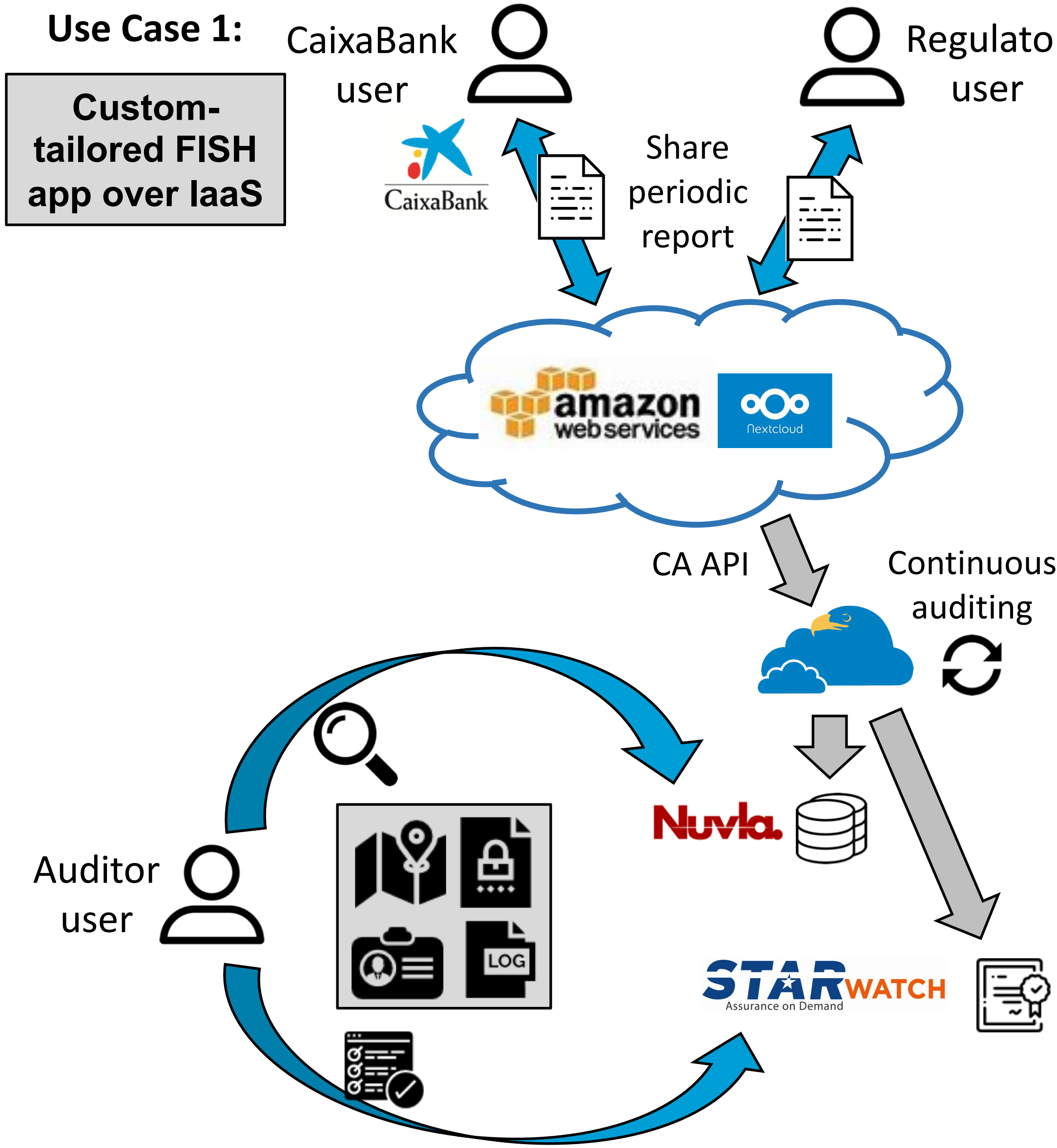
Continuous Auditing Technical Architecture
Use case specification



Use Case 1:

Custom-tailored FISH app over IaaS

CaixaBank user

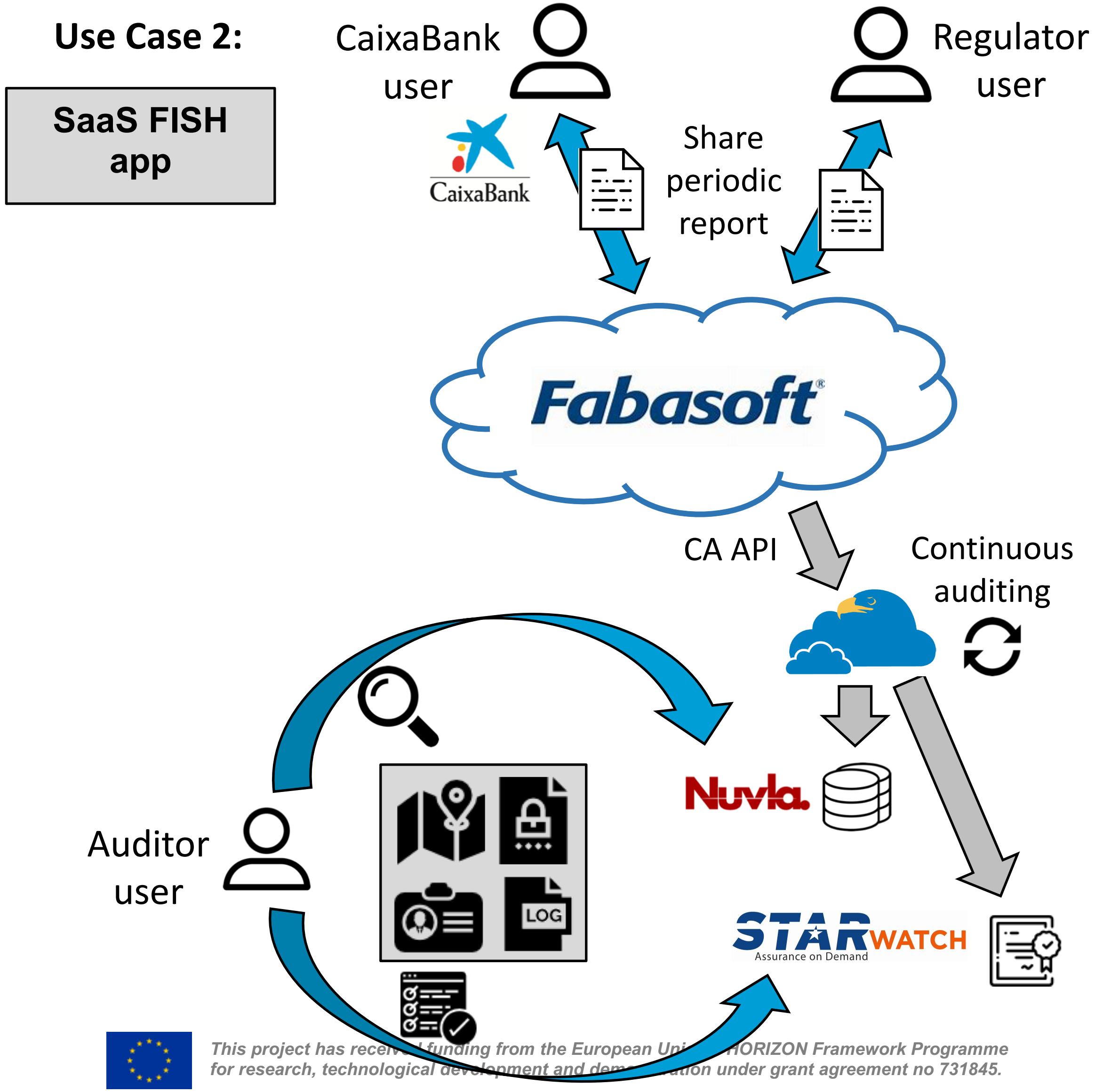
Regulator user

Share periodic report

CA API

Continuous auditing

Auditor user



Use Case 2:

SaaS FISH app

CaixaBank user

Regulator user

Share periodic report

CA API

Continuous auditing

Auditor user

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Continuous Auditing-based Certification Pilot
Conclusions

- All tools are correctly integrated and work as expected.
- Enabled a continuous audit of 15 SLO/SQOs.
- The pilot was demoed multiple times to various stakeholder, testing both success and failures for each SLO/SQO.

- The pilot shows that the tools adequate for the task.
    - The tools were reviewed and concluded that they are adequate for the purpose of the pilot.
    - External stakeholders were also able to use the tools and see how they reported compliance in real-time.

- Internal and external stakeholders were able to witness the practicality of continuous audit-based certification.
    - The feedback provided by internal stakeholders and the External Advisory Board is generally positive.

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Continuous Auditing-based Certification Pilot
Conclusions

- **First step towards the Continuous Auditing based Certification.**
  - Framework & governance model defined.
  - Reference architecture and modules implemented and deployed.
  - FISH use case tested within EU-SEC partners and external stakeholders.

- **Flexibility to define the audit controls and the way to store evidence records.**

- **It does not completely substitute point-in-time auditing.**
- **Still needs some trust on the CSP and the contract with the customer.**

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Continuous Auditing-based Certification Pilot

Conclusions

EUSEC
EU SECURITY CERTIFICATION

Value proposition & benefits:

Different actors and perspectives

Certification Authority

Assurance and transparency

Continuous certification framework

Methodology

Implementation guidance

- Free material

- Paid training

Public registry of excellence

Auditor

Computer-assisted, automated auditing

Increase productivity

Extend the auditing services

Guidance

Support

Training

Cloud Service Provider

Real-time & automated security control checking

Save money (on the long run)

Competitive advantage from “big players”

Proof of Trustworthiness

Quality / Professionalism label

Easier cooperation / partnerships

Cloud Customer

Certification

Compliance to regulators

Easier Cloud Service adoption

Cost reduction

Demonstrate trustworthiness to own customers

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Continuous Auditing-based Certification Pilot
Strong partners allow for commercial kick off

- **CSA**: Long term provision and maintenance of the Continuous Auditing-based Certification scheme
- **NIXU, PWC:** Provision of consultancy and audit services dedicated to Continuous Auditing-based Certification
- **Fraunhofer, SIXSQ and CSA**: Provision of tool to drive the operationalization
  - StarRegistry: Mean to publish and maintain Certificates from Continuous Auditing-based Certifications.
  - Clouditor: Cloud Compliance Tool to automatically check the compliance status of a cloud service.
  - Nuvla: Portal for the management and analysis of evidence records, both for supporting the continuous auditing process and for rapid visual assessment of compliance.
  - Continuous Auditing API: Standardized access to Cloud Service Provider security controls information
- **Fabasoft, CAIXA:** Initial adopters of the Continuous Auditing-based Certification

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Continuous Auditing-based Certification Pilot
References

- Deliverables
  - EU-SEC D2.2 – Continuous Auditing Certification Scheme
  - EU-SEC D5.1 – Pilot Definition
  - EU-SEC D5.2 – Pilot Implementation and Testing of Continuous Auditing
  - EU-SEC D5.3 – Analysis of Pilot Results
- White Paper
  - Continuous Auditing based Certification white paper
- Scientific Papers
  - Continuous Location Validation of Cloud Service Components
  - A Process Model to Support Continuous Certification of Cloud Services
  - Towards Continuous Security Certification of SaaS Applications Using Web Application Testing Techniques
  - Evaluating the Performance of Continuous Test-based Cloud Service Certification

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CABC for Cloud Users

Ramon Martín de Pozuelo (CAIXABANK)

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CABC for Cloud Users

- **Cloud users should be the main promoters of CABC**
  - **Do all cloud users need CABC?**
  - **Customers of sectors that deal with sensitive critical information (Financial, Health, Public Adm., etc.)**

- **Certification and compliance**
  - **Demonstrating cloud security control enhancement to regulators.**
  - **Aligned with CSP CERT WG recommendations for the implementation of the CSP certification scheme.**

- **Security as a business value**
  - **Demonstrate trustworthiness to own customers**

- **Easier Cloud Service adoption**
  - **Access to real-time assurance of CSPs**
  - **Streamline the CSP validation**
  - **Cost reduction**

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CABC for Certification Authorities

Alain Pannetrat (CSA)

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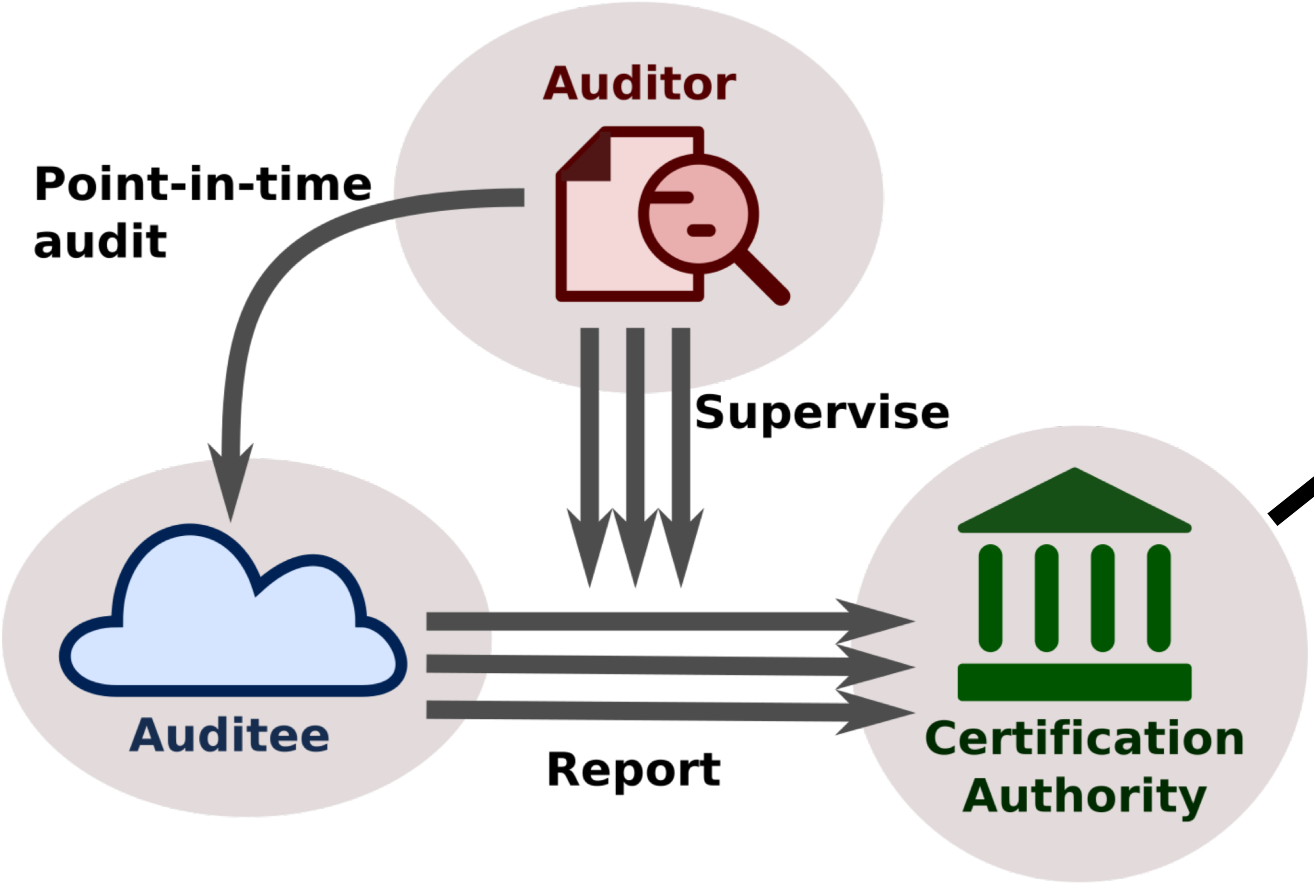

- Accreditation of CBs
- Certification registry
- Complaints
- Standardisation

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Accreditation of certification bodies

- Auditors will need extended skills
  - Tool validation
  - Monitoring

- CA to maintain a public registry will list accredited certification bodies.

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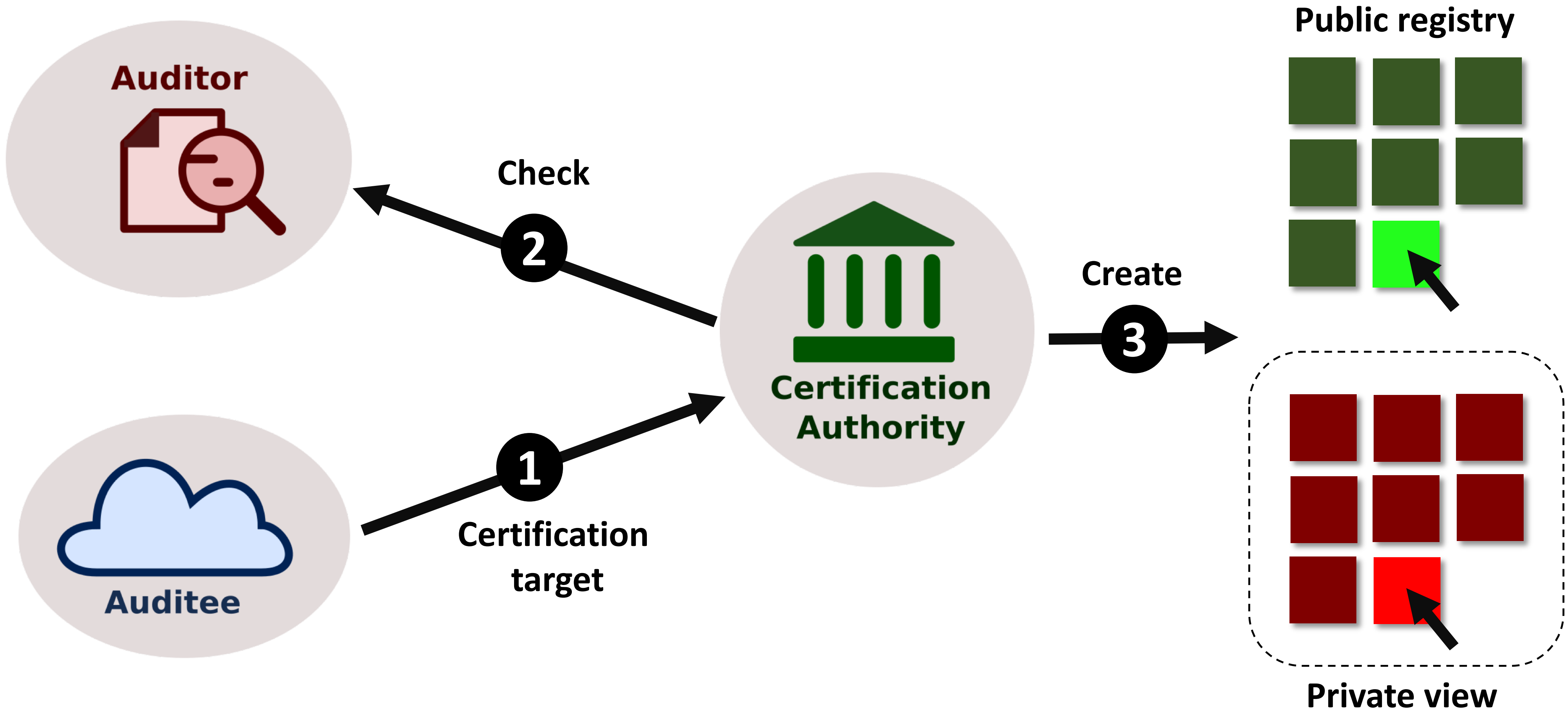
Certification registry: initialization



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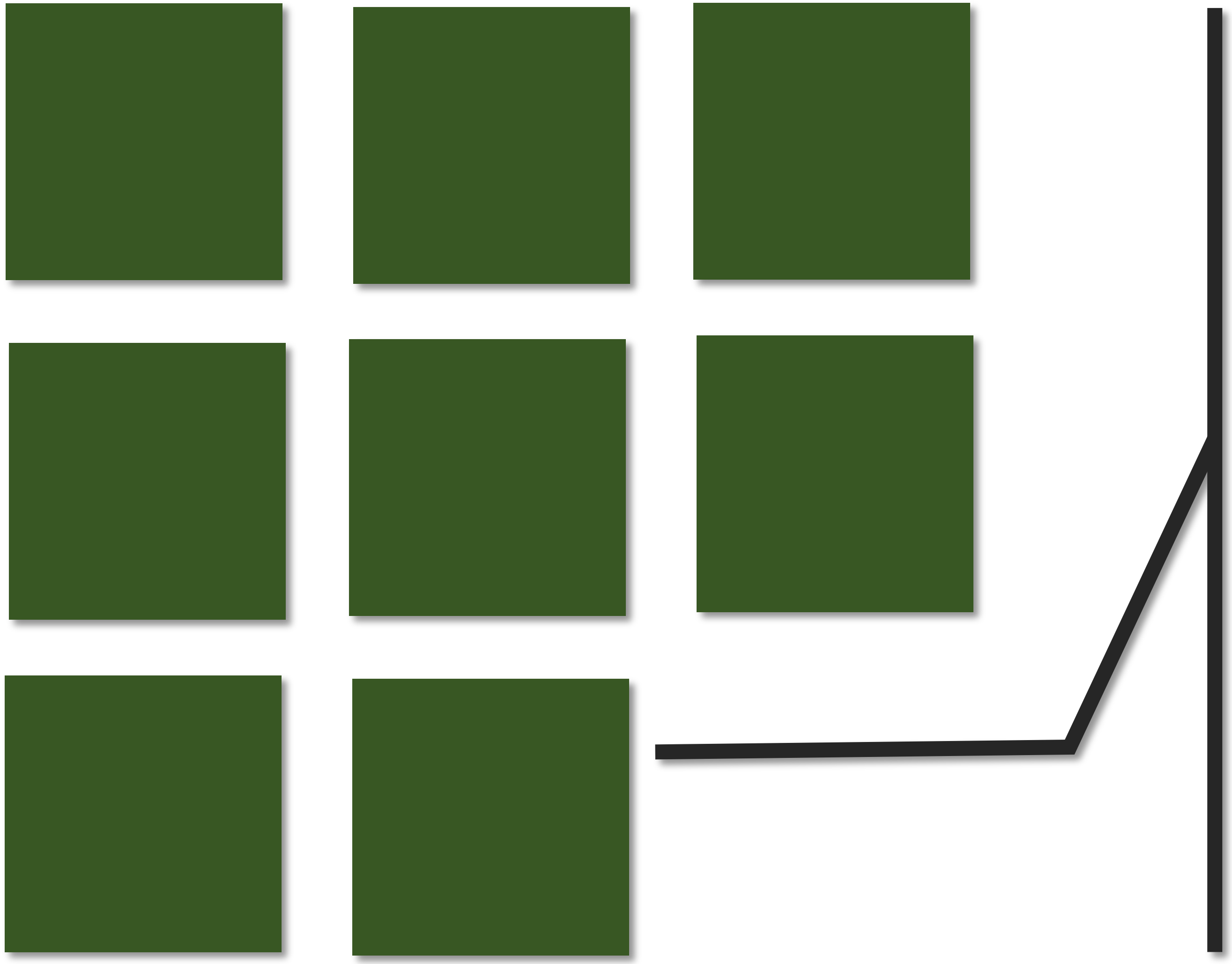
Public registry



- Identity of CSP and scope
- The start and end date
- The last verification date
- The state of the assessment:
  - Pending
  - Ended
  - Running/Valid

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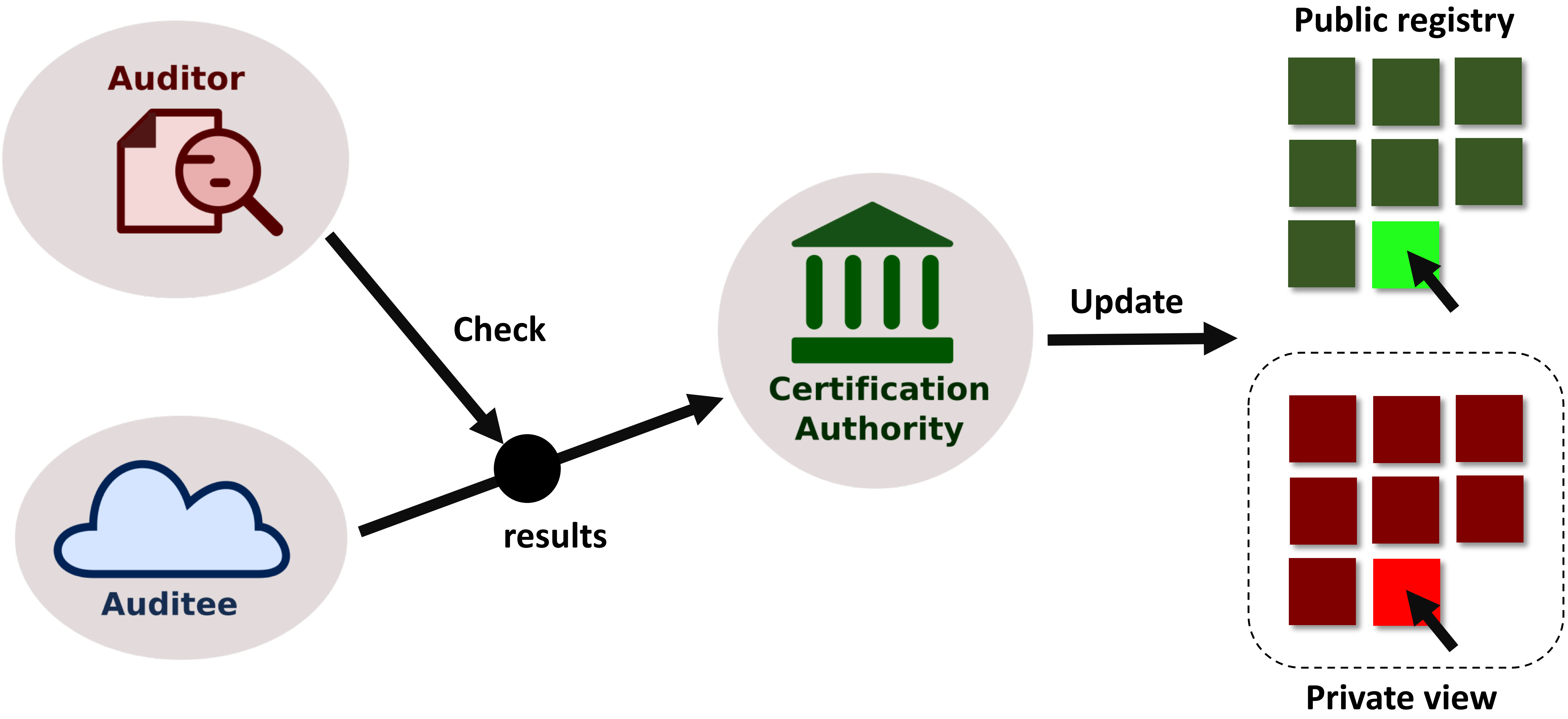
Certification registry: updates



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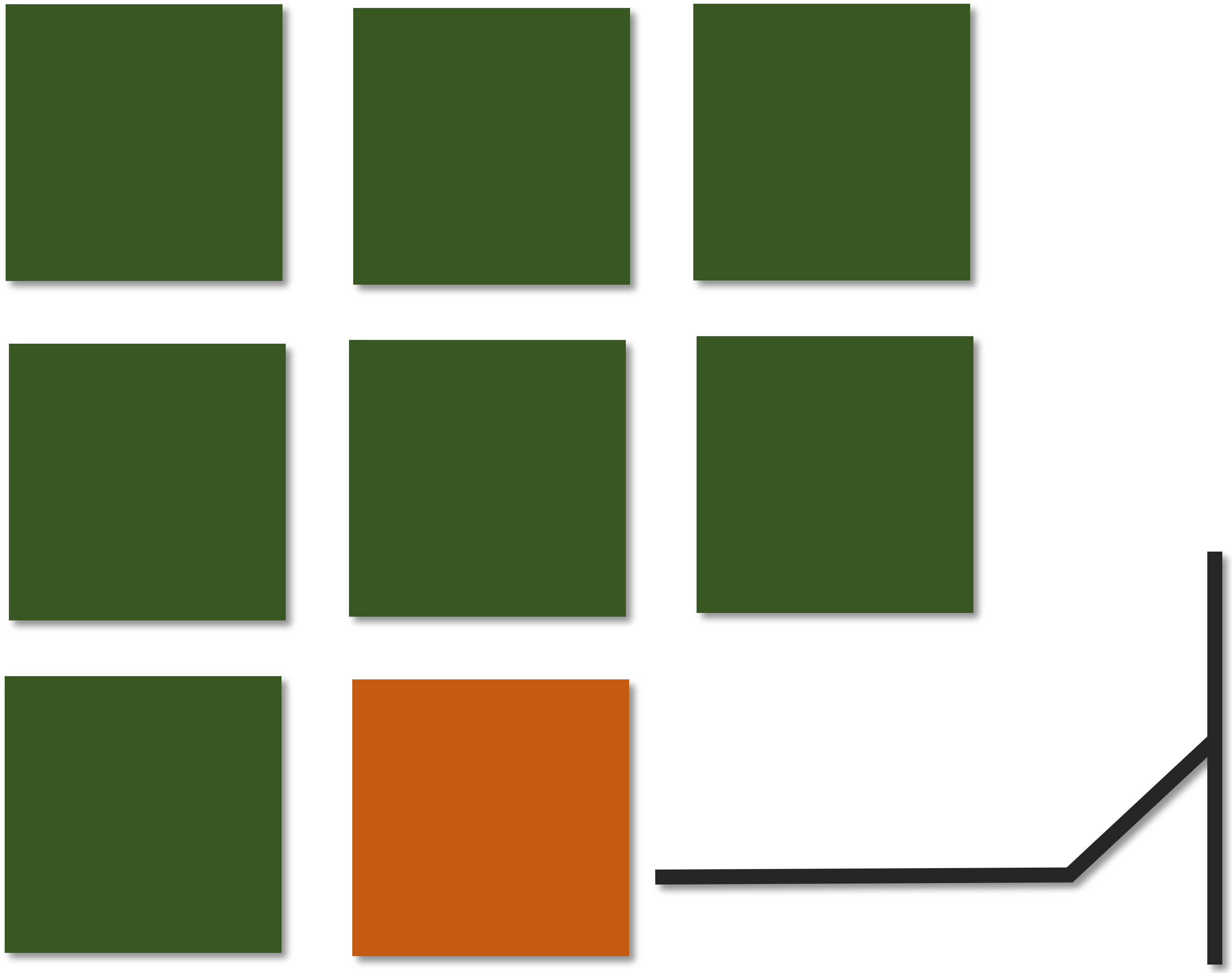
Public registry: temporary non-compliance



- Verification date < now
- The state of the assessment:
  - Running/Valid

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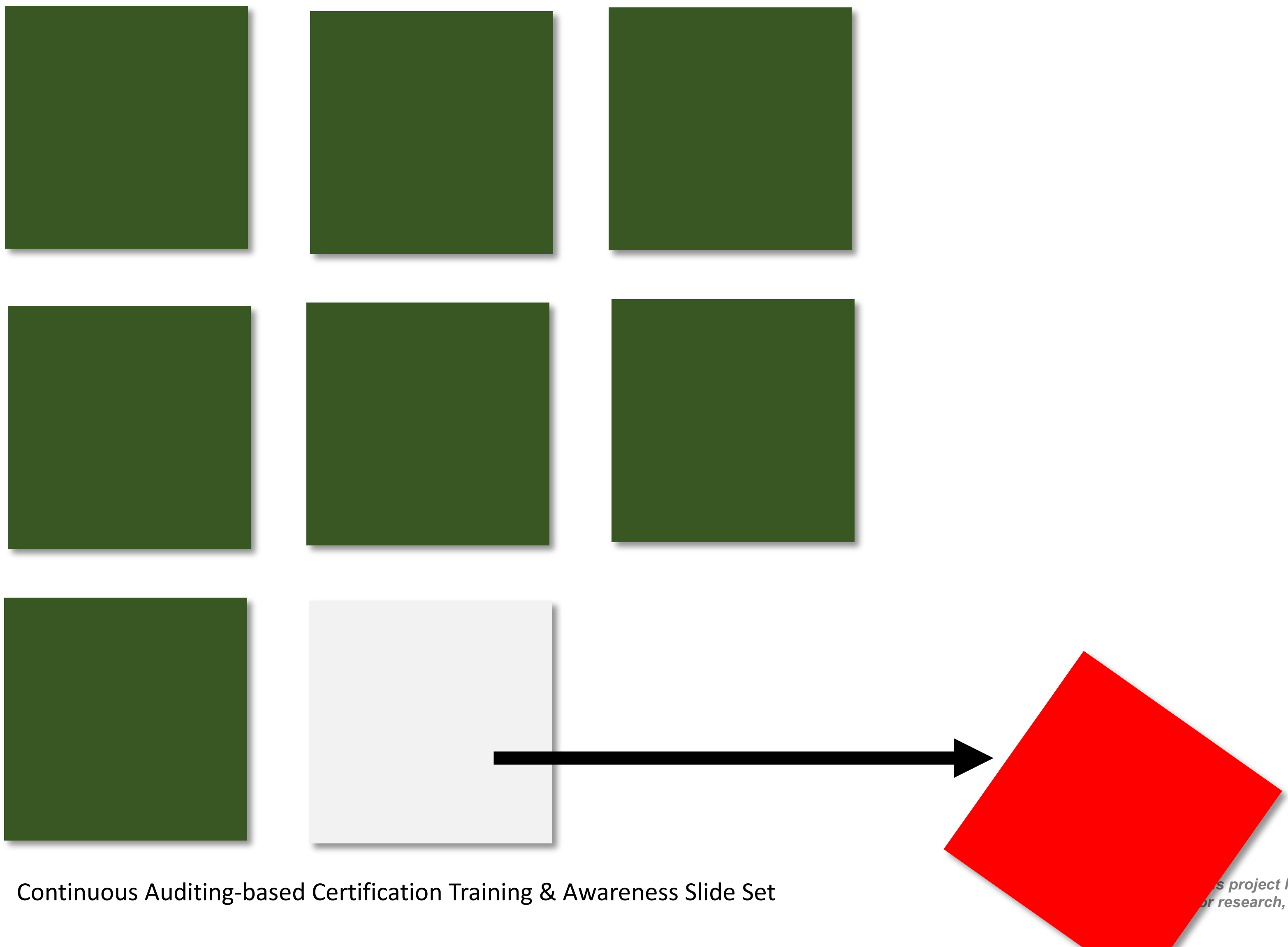
Public registry: revoked certificates are removed



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Complaints & Standardization

- Possible complaints
  - Non-compliance detected by end-users
  - Unfair revocation
- Standardization and best practices
  - Measuring security
  - A catalogue of industry-agreed security and privacy attributes/metrics.

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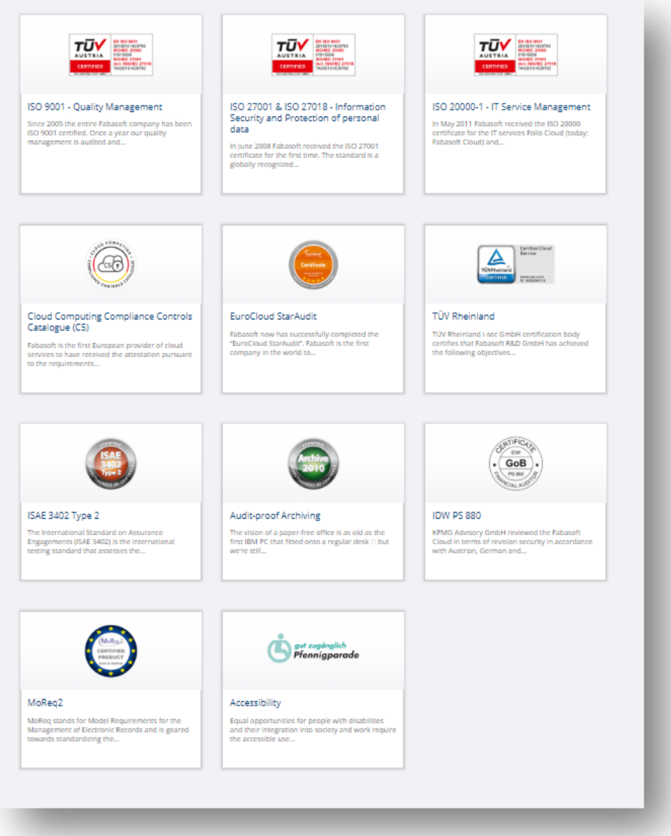
CABC for CSPs

Björn Fanta (FABASOFT)

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

The „Why?“

- Our goal of approaching CABC is to enhance the overall visibility of the organization and its security measurements / precautions as well as the effective use of technology



ISO 9001 - Quality Management

Since 2005 the entire Fabasoft company has been ISO 9001 certified. Once a year our quality management is audited and...

ISO 27001 & ISO 27018 - Information Security and Protection of personal data

In June 2008 Fabasoft received the ISO 27001 certificate for the first time. The standard is a globally recognized...

ISO 20000-1 - IT Service Management

In May 2011 Fabasoft received the ISO 20000 certificate for the IT services Folio Cloud (today: Fabasoft Cloud) and...

Cloud Computing Compliance Controls Catalogue (C5)

Fabasoft is the first European provider of cloud services to have received the attestation pursuant to the requirements...

EuroCloud StarAudit

Fabasoft now has successfully completed the "EuroCloud StarAudit". Fabasoft is the first company in the world to...

TÜV Rheinland

TÜV Rheinland i-sec GmbH certification body certifies that Fabasoft R&D GmbH has achieved the following objectives...

ISAE 3402 Type 2

The International Standard on Assurance Engagements (ISAE 3402) is the international testing standard that assesses the...

Audit-proof Archiving

The vision of a paper-free office is as old as the first IBM PC that fitted onto a regular desk □ but we're still...

IDW PS 880

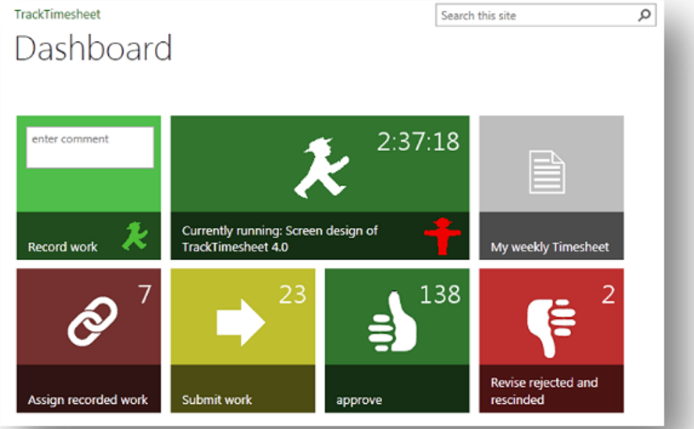
KPMG Advisory GmbH reviewed the Fabasoft Cloud in terms of revision security in accordance with Austrian, German and...

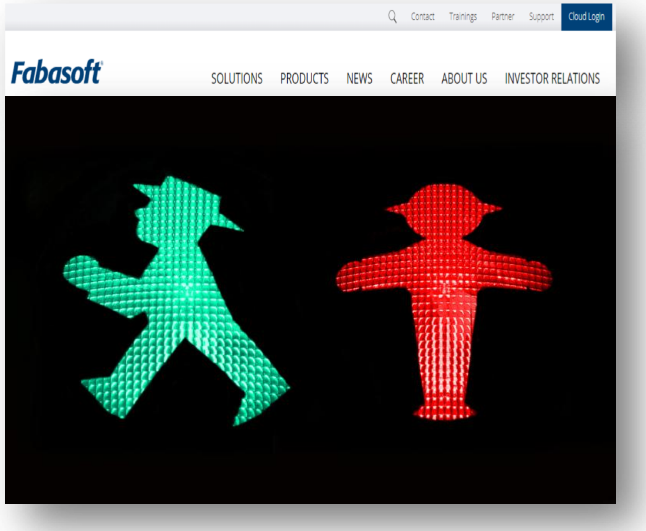
MoReq2

MoReq stands for Model Requirements for the Management of Electronic Records and is geared towards standardizing the...

Accessibility

Equal opportunities for people with disabilities and their integration into society and work require the accessible use...





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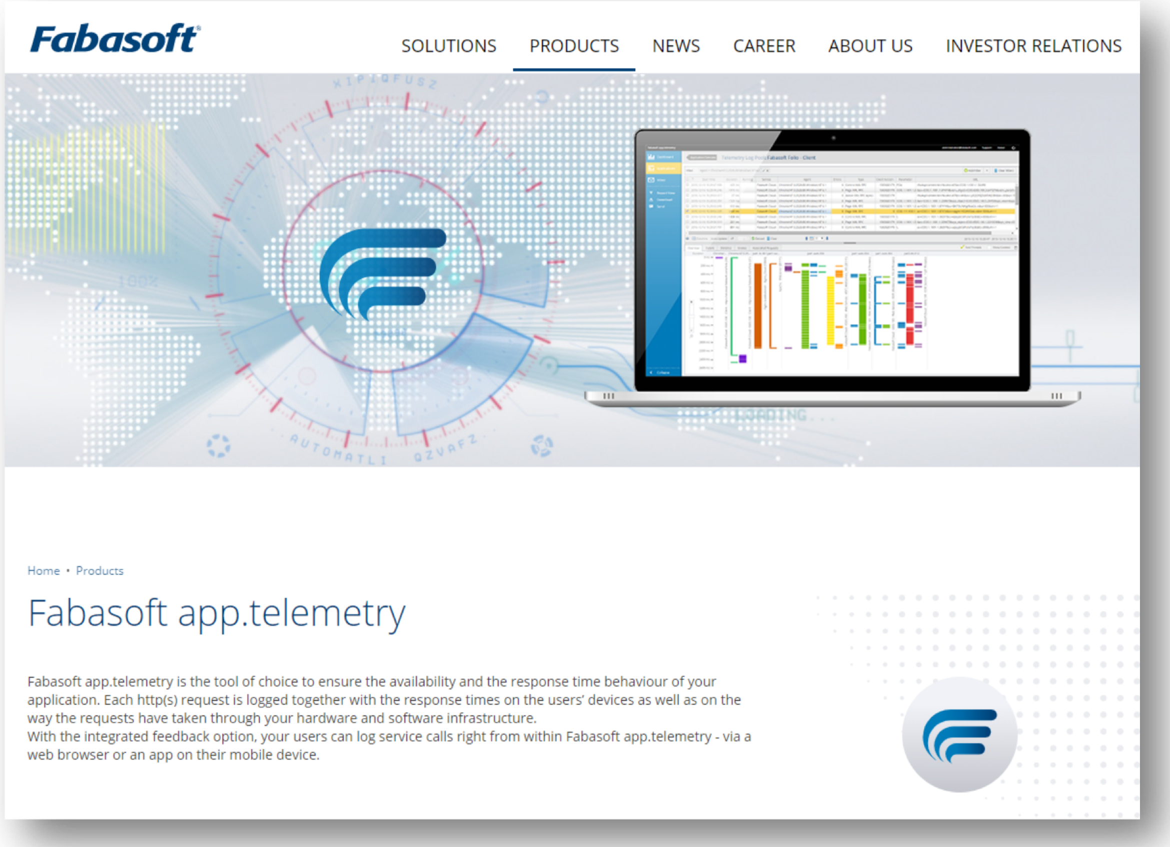
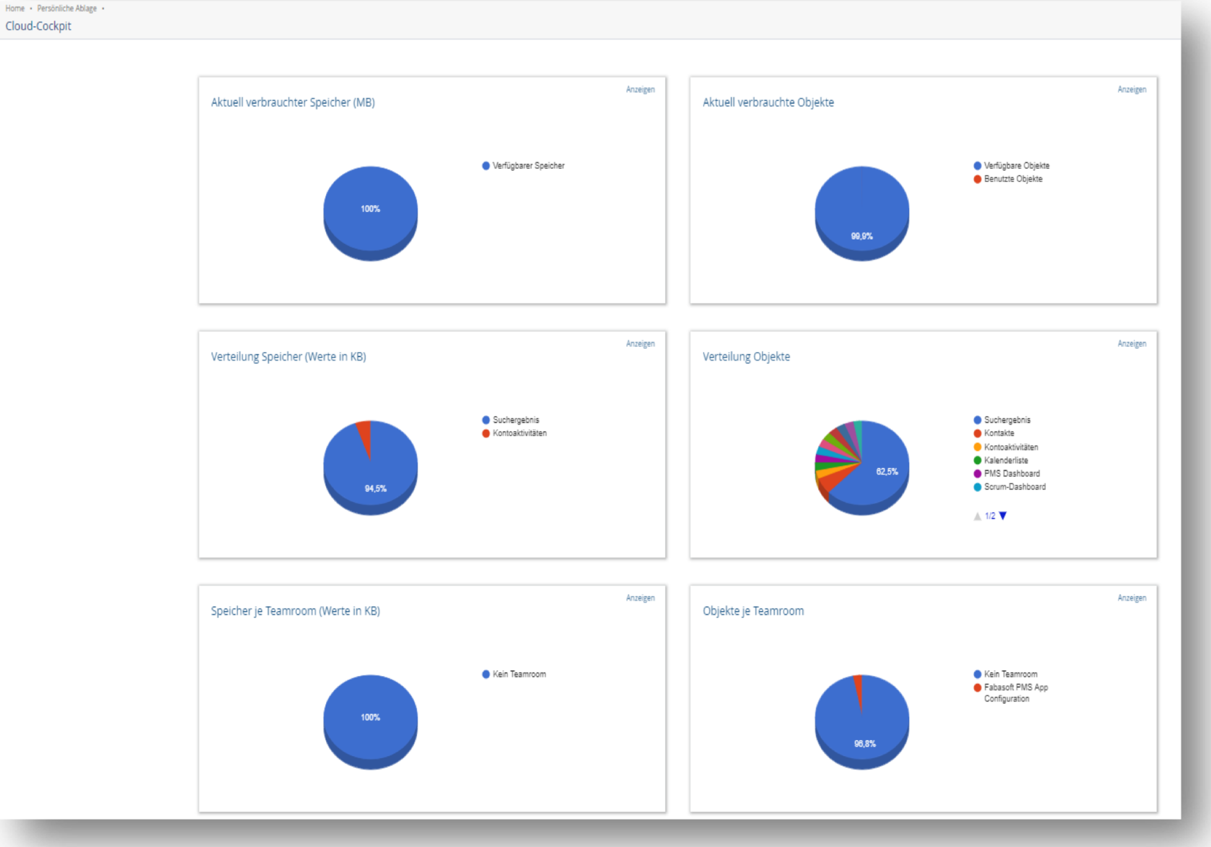
„Under the Hood“

- A key element is to understand the technical implementation for a set of requirements



Fabasoft app.telemetry

Fabasoft app.telemetry is the tool of choice to ensure the availability and the response time behaviour of your application. Each http(s) request is logged together with the response times on the users' devices as well as on the way the requests have taken through your hardware and software infrastructure.
With the integrated feedback option, your users can log service calls right from within Fabasoft app.telemetry - via a web browser or an app on their mobile device.



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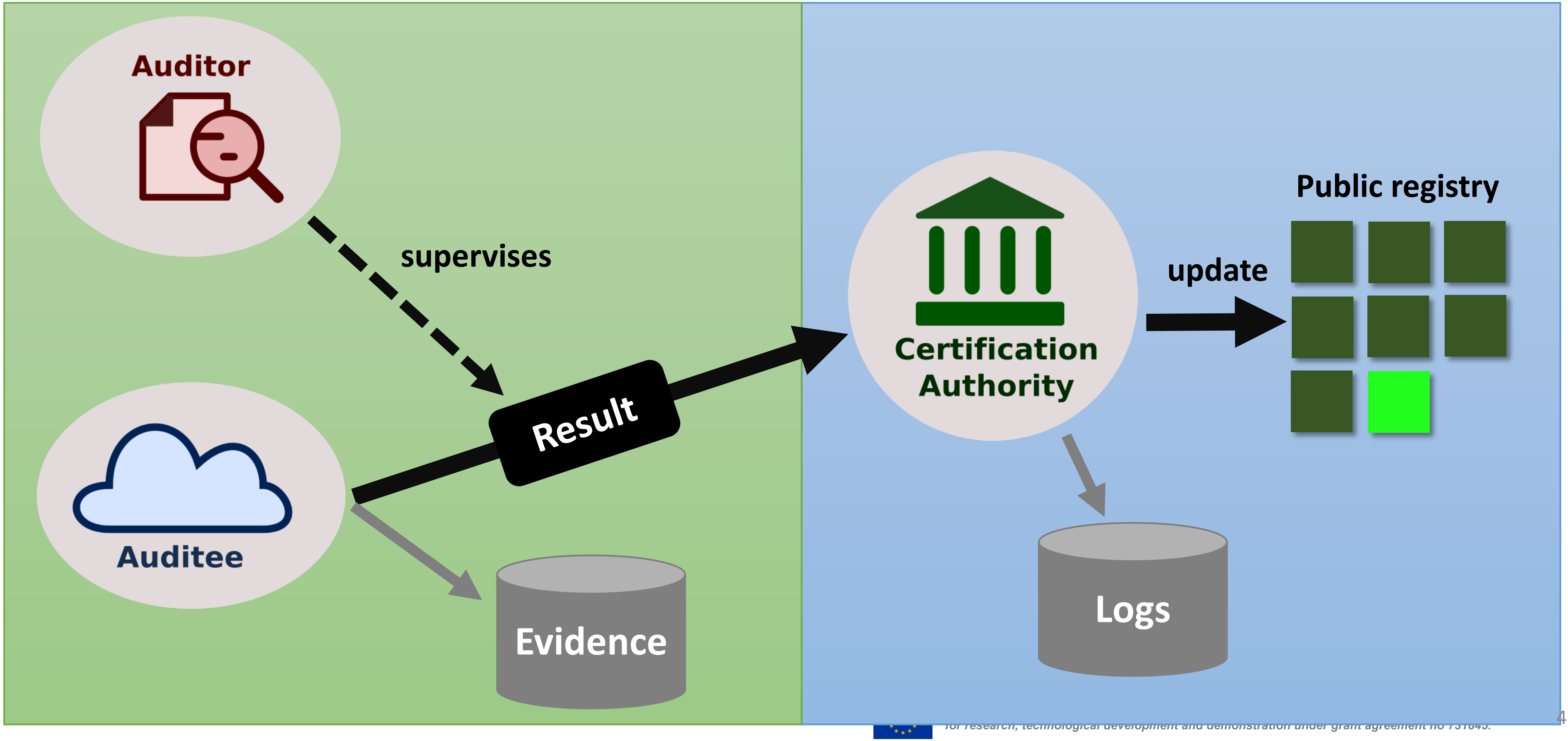
„Technology Gap“



for research, technological development and demonstration under grant agreement no 731845.

The „How?“

- With our own controls, **we can derive a formalization for certain sets of requirements**
    - in line with the proof of concept, provided by the EU-SEC Framework

- We can then decide on continuously monitored evidence collection and connect to tools like “Clouditor”

- Resulting in:
    - Greater audit efficiency and effectiveness
    - A long-term reduction of complexity
    - Enhanced internal controls and improved performance
    - More timely information to expedite response and reduce cost
    - Greater transparency for us and our customers

#benefits

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CABC for Technology Providers

Christian Banse (FRAUNHOFER AISEC)

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

Continuous Auditing Based Certification for Technology Providers

- Tools that support Continuous Auditing are the glue between Service Providers and Auditors
- Tools need to potentially address different stake holders
    - Auditors
    - Security Officers
    - Internal Compliance Officers
- Tools need to interface with different components in the certification scenario
    - Service Providers (*to audit*)
    - Storage / Databases / Evidence systems (*to store and possibly retrieve digital evidences*)
    - Certification Bodies / Scheme holders (*to update the compliance status*)

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Continuous Auditing Based Certification for Technology Providers

- The world of service providers is constantly evolving and growing
  - EU-SEC efforts to harmonize and standardize interfaces to retrieve auditing information from Cloud services (https://github.com/eu-sec/continuous-auditing-api-spec)
  - Deliverable 3.5 offers a standardized format for the transmission of compliance status to certification bodies (currently implemented in CSA StarWatch)
- *Clouditor* as reference implementation for a continuous auditing tool
  - Community edition Available as Open Source implementation from Fraunhofer AISEC on GitHub
  - https://github.com/clouditor/clouditor

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CABC for Auditors

Tatu Suhonen (NIXU)

This project has received funding from the European Union's HORIZON Framework Programme for research, technological development and demonstration under grant agreement no 731845.

CABC - What’s the interest for auditors?

- Traditional approach has its limitations
  - Audits are project-like point-in-time audits
  - Passive monitoring
    - Auditee’s notification of significant change
    - Complaints
    - Special audits
  - Period of uncertainty between audits
- Continuous auditing as a solution for better assurance
  - From passive to active monitoring
    - Ability to actively conduct surveillance activities
    - Auditor is less dependent of information from external sources
  - Frequency of checks is shorter for automated controls
    - Control is in place with higher probability in next audits as well

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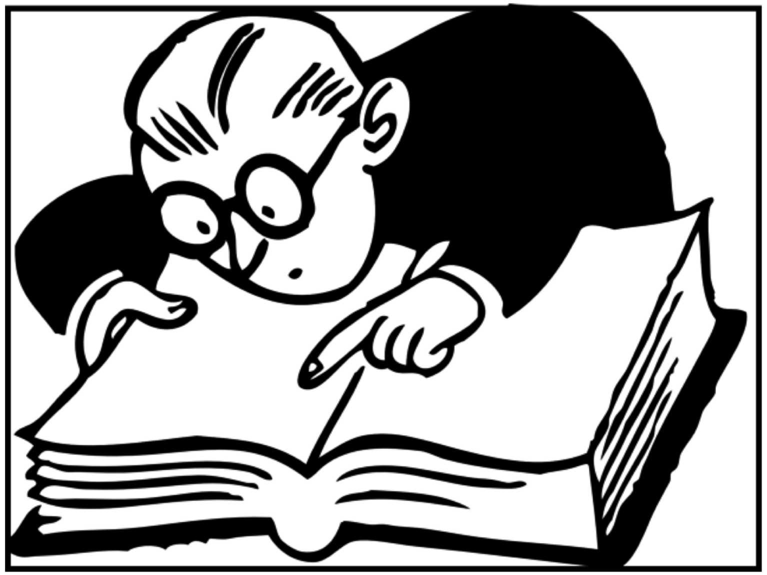
CABC – Point-in-time audits

- Traditional audits still play a key role
  - Possibility to have a more in-depth analysis of the environment
    - Automated controls follow a predefined ruleset to collect and analyze evidence
    - Point-in-time audits allow to have a closer look into security controls if needed
  - Some controls require human intervention
    - Written security policies, physical security etc.
  - Multiple channels of verification
    - Automated controls can use multiple channels of verification
    - Humans can be more creative (observation, document review, interview, technical tests etc.)
  - Certification life-cycle needs to be followed
    - Yearly surveillance/recertification audits are necessary to maintain certification



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Continuous audit monitoring

Auditor has the responsibility for continuous monitoring and status of certification

- The auditor is provided with access to the monitoring tools
  - ability to verify the monitoring tools’ evaluation results as well as the configuration of the monitoring tools

- Trust towards the monitoring tools is required
  - Quality definition of SLO’s and SQO’s is essential to ensure that right things are monitored
    - Link between security controls and the evidence collection results must be trustworthy
  - Evaluation of tool configuration
  - Evaluation of measurement processes to ensure evidence suitability
    - Right things are measured
    - Correct evidence is used

- Use of validated products is highly recommended as auditor’s trust is required
  - If measurement results can’t be trusted, a certificate can’t be granted.

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CABC - What’s the interest for auditors?

New business opportunities

- CABC as a service is new
- Possibility to extend service portfolio from project assignments towards continuous services
- Competitive advantage

Conduct yearly surveillance/recertification audits with less effort

- Auditee preparation: continuous security instead of last-minute preparation
- Continuous auditing ensures less time spent on remediation activities
- Time & effort saved, audits finish on time

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Thank you for your attention!

Web: https://www.sec-cert.eu/

Contact: *contact@sec-cert.eu*

Twitter: @EU_SEC

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