CYBERSECURITY AND DIGITAL TRUST

An innovation domain of the canton of Vaud
THE CANTON OF VAUD AT THE FOREFRONT OF CYBERSECURITY AND THE TRUST ECONOMY

The Lake Geneva region and the canton of Vaud have seen themselves as a reference in the field of cybersecurity and the trust economy. A position strengthened with the launch of the “Trust Valley”.

Cybersecurity has become a major challenge for governments and businesses worldwide. Digital attacks can infect computer systems, cause sensitive data to be leaked, or allow third parties to use stolen data for profit. The challenge is, therefore, to develop innovative tools to more effectively control access to sensitive data, authentication, and ensure product traceability.

With its reputation for security, neutrality, and reliability, Switzerland is particularly well-positioned to meet the IT security challenges of today. To modernize this tradition, the cantons of Vaud and Geneva have decided to officially launch the “Trust Valley”, a joint economic development initiative in October 2020. It brings together more than 500 experts, which constitutes the largest talent pool in the field in Switzerland. The synergies between research institutes and universities are based on these renowned players. Nearly 300 companies and organisations active in the region are driving this dynamism. Among the founding members are ELCA, Kudelski, SGS and SICPA.

The genesis of this initiative is linked to important ongoing developments in the region: the creation of the Cyberpeace Institute, the Swiss Digital Initiative, the Geneva Digital Talks in Geneva, the launch of an innovation campus dedicated to the trust economy by SICPA, the deployment of the digital strategy aimed at making the canton of Vaud a “data territory”, and the implementation of the National Strategy for Protection against Cyber risks (SNPC) at the national level.
A DYNAMIC ECOSYSTEM

The canton of Vaud and the Lake Geneva region are home to many companies developing innovative solutions. Among them, security leaders Kudelski and SICPA and start-ups such as Global ID, which is currently developing a tool based on the finger vein network to secure transactions.

Fundamental development in the field of digital technology is driven by SMEs, high-tech companies, and the various institutes located in the canton of Vaud. ELCA, Kudelski and SICPA, founding members of the Trust Valley, have consolidated the field’s know-how. In addition to these business partners, the universities and research institutes’ scientific and academic expertise is also available. Among them are the Swiss Federal Institute of Technology in Lausanne (EPFL) and the Center for Digital Trust (C4DT), launched in 2017; The School of Engineering and Management of the canton of Vaud (HEIG-VD) with its cybersecurity branch, Y-Security and of the University of Lausanne (UNIL) with its school of criminal sciences.

Biometric security
Biometrics is at the heart of data access and security issues. The Idiap Institute of Martigny, affiliated to the EPFL, is dedicated to research and training in perceptive and cognitive systems technology in biometric recognition. Its research and testing centre in this area has become third in the world and the first outside the United States to be authorised to issue biometric certifications. This organisation was created by a

THREE QUESTIONS TO LENNIG PEDRON, HEAD OF THE TRUST VALLEY INITIATIVE

How is digital trust built?
Digital trust is based on user experience. Digital platforms and technologies must prove their ability to guarantee a secure digital environment. The issue of data storage is also important. Users attach particular importance to the ethical use of the data they provide.

What advantages does Switzerland have in this area?
Switzerland is ideally positioned thanks to its world-renowned expertise in governance. Building on its legacy of protecting valuable assets, the Federal Council has developed a strategy to protect against cyber risks. The government is therefore working closely with business, cantons and universities to implement an innovative strategy at the national level in which digital trust plays a central role.

What are the specifics of the canton of Vaud and the Lake Geneva region?
The region benefits from a rich and exceptional digital ecosystem. This is based on a world-class academic network, a strong and innovative group of industries – as evidenced by the Square One initiative launched by SICPA, a dense network of active SMEs and a fertile network of start-ups in the field of digital trust. The strength of the Lake Geneva region also lies in the concentration of experts specialising in cybersecurity. This ecosystem has the capacity to develop practical and innovative solutions, as demonstrated by the success of the Tech4Trust start-up acceleration program. The Lake Geneva area is also attracting the leaders in the field, as demonstrated by the creation of the CyberPeace Institute, active in supporting victims of digital attacks, which is supported by Microsoft.
THREE QUESTIONS TO SYLVAIN PASINI, PROFESSOR AT THE HEIG-VD AND DOCTOR IN CRYPTOGRAPHY

What areas does cybersecurity encompass?
The concept gathers all issues related to the protection of information and people in the digital field. It is a broad field that includes computer science, network management, robotics and telecommunications. Cybersecurity applies to the technical dimension but also concerns legal, organisational and behavioural aspects.

What are Switzerland's advantages in this area?
Switzerland benefits from its image as a secure country, its neutrality, its stability, and an appropriate legal framework. Moreover, the distinctiveness of the country lies in the fact that a large part of its strategy is based on the ability of its citizens to protect themselves. This is probably linked to our historical know-how in the protection of valuable assets, goods or banking transactions. Today, data is one of the most valuable assets.

How could the potential of the canton of Vaud be further developed?
We have an incredible ecosystem in the canton of Vaud. It is essential to foster innovation through collaborations, and we have the advantage of bringing together many industrial and academic players. At the HEIG-VD, we are very proud of our collaboration with players like Y-PARC Swiss Technopole, which today hosts numerous spin-offs, such as Netguardians, Sysmosoft and strong.codes (see box p.19). We are building a platform to promote exchanges in the canton.

Data protection
At EPFL, research focuses on innovation in data protection, namely with the Security and Cryptography Lab – specialised in cryptography, and the Cyber Defense Campus of Armasuisse. This structure brings together experts from industry and the scientific world and works around identifying threats brought about by new technologies. The centre develops practical solutions and trains cyberspecialists. Contributing to these developments is the expertise of academic institutions such as the HEIG-VD and its IICT centre, Institute for Information and Communication Technologies.

On the business side, the Teserakt company offers software to secure connected objects. An innovative project is designed from simple software, which can be added to a connected device without modifying the server.

Another area related to the security of digital devices focuses on the fight against counterfeiting. Numerous start-ups and specialised industries in this field are developing innovative tools. At the level of traceability, the Vaud-based company ScanTrust offers QR codes that are impossible to copy, allowing users to follow a product’s path through the supply chain to detect counterfeits. Vaud-based start-up Kaios ID has developed a discreet way to trace products. The technology created by the start-up integrates invisible patterns into the packaging that can be authenticated using a cell phone. SICPA, the leader in secure inks for banknotes, is building the Square One campus intending to bring together academic and industrial partners to become a major player in the field.

On a purely digital level, the Swiss start-up Quantum Integrity, founded in 2017, has set up a tool to detect falsified videos using artificial intelligence.
NATIONAL CENTER FOR CYBERSECURITY

The Federal Council is implementing a national strategy, in collaboration with academic and industry players, to increasingly promote CYBERSECURITY AND DIGITAL RELIABILITY as a Swiss area of expertise.

To further enhance the federal strategy to protect against the risk of cyber attacks, the Federal Council established the National Center for Cybersecurity in January 2019. In the form of a federal agency, this structure is based on the know-how and expertise of the Reporting and Analysis Centre for Information Assurance (MELANI).

MELANI functions as a national contact point for reporting digital incidents and answering questions about cyber risks. Its teams are in charge of creating cybersecurity standards and collaborate with research and scientific communities through international partnerships to develop the technical plan.

This centre complements the implementation of the National Cyber Risk Protection Strategy (NCPS). Led by the Federal Department of Finance, the strategy defines seven objectives to be achieved in ten fields of action. These range from the acquisition of skills and knowledge and the promotion of international cooperation, to the strengthening of incident and crisis management and cooperation in the criminal prosecution of cyberattacks, to cyber defence

INSOMNI’HACK, BLACKALPS: KEY EVENTS IN THE CANTON OF VAUD

In just a few years, French-speaking Switzerland has established itself as a major European centre for cybersecurity and digital trust, hosting several key events to showcase the dynamism of this sector. The Insomni’hack security conference, conceived by the Vaud-based digital security company SCRT which consists of several conferences and workshops. The event also holds an ethical hacking competition in digital security.

Every year since 2017, the non-profit organisation BlackAlps holds two days of conferences centred around cybersecurity at the Y-Parc innovation centre. Hosted by the HEIG-VD, this event also offers workshops and networking opportunities with international experts.

The number of experts in cybersecurity and trust economy amounts to more than 500 in French-speaking Switzerland.
measures by the armed forces and the Federal Intelligence Service, as well as the strengthening of incident and crisis management and cooperation in the criminal prosecution of cyberattacks.

**Digital governance**

In parallel, the Trust Valley includes a national structure to provide an ethical and sustainable framework for the use of digital technology: the Swiss Digital Initiative (SDI). Launched jointly with the University of Geneva, the canton of Vaud and the World Economic Forum, it aims to develop a label that will guarantee users the safety, reliability and respectful management of their data. The structure will be supported by the Foundation of the same name, based in Geneva and backed by the Federal Council. To strengthen Switzerland’s position, the Graduate Institute of Public Administration (IDEHAP) and the University of Lausanne are jointly proposing a CAS in digital government aimed at providing the necessary foundations to understand and manage the process of the digital transformation of public and semi-public organisations.

**Unique funding opportunities**

The Swiss National Science Foundation (SNSF) promotes fundamental research in all scientific disciplines and supports more than 8,500 researchers every year. The SNSF works closely with universities and international organisations such as Science Europe, the umbrella organisation for the leading research organisations and their funding in Europe, to ensure optimal international relations.

Swiss companies can make use of Innosuisse (formerly CTI). The agency also supports people who wish to set up or take over a company that provide awareness-raising, coaching and training. Finally, Innosuisse is responsible for awarding scholarships to university graduates involved in original entrepreneurial projects.

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**“The value and therefore the trust placed in economic actors is now intrinsically linked to the strategy with which they are structured and deployed to create a secure digital world. As a centre of expertise, The Trust Valley, will help to make Switzerland a leader in the field of digital trust.”**

**MARTIN VETTERLI, Président de l’EPFL**

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**TECH4TRUST: AN ACCELERATOR OF DIGITAL TRUST**

Launched in 2019, the Swiss start-up acceleration programme Tech4Trust aims to bring together industry players and universities active in the field of cybersecurity and digital trust. Led by the EPFL Innovation Park, the structure provides advice on technical and commercial development to the fifteen or so start-ups it hosts. They then participate in a roadshow across five cantons to forge links with established companies. The accelerator is part of a broader initiative financed by the economic promotion of the canton of Vaud and private companies including ELCA, SICPA and Kudelski, intending to develop a solid ecosystem in terms of cybersecurity and digital trust in the region. In the 2020 edition, no less than twenty start-ups will be recruited to anchor the region in the Trust Valley and to present projects under proper guidance.
Financing is also available for SMEs and start-ups active in high-tech sectors. The Foundation for Technological Innovation (FIT) offers grants and loans to support the development of innovative technological projects at different stages of their development. A total of three grants are available with FIT Grant (before the company is set up), FIT Seed (during the first year of existence to develop the business) and FIT Growth to accelerate the commercial aspect during the first three years.

In addition to FIT, The Office for Economic Affairs and Innovation (SPEI) also provides financial assistance. These are intended to support projects related to innovation, the development of R&D and production resources, the internationalisation of markets or the training of technical staff.

There are more than 300 organisations and companies active in the field of cybersecurity and digital trust in the Lake Geneva area.

Worldwide, about 60% of SMEs victims of hacking go bankrupt within 6 months.
# MAIN ACTORS OF CYBERSECURITY AND DIGITAL TRUST ECOSYSTEM

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<th>Areas of activity</th>
<th>Key competences</th>
<th>Key actors</th>
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<td>Data protection</td>
<td>Cryptographic algorithms</td>
<td>Adeya&lt;br&gt;C4DT (EPFL) &lt;br&gt;INPHER&lt;br&gt;Revapost&lt;br&gt;Y-Security</td>
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<td></td>
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<td>MedCo&lt;br&gt;Pryv</td>
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<td></td>
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<td>Global ID&lt;br&gt;OneVisage</td>
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<td>LinkAlong&lt;br&gt;Nviso&lt;br&gt;PredictiveLayer&lt;br&gt;Privately</td>
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<td>Cysec&lt;br&gt;Guardtime&lt;br&gt;Metaco</td>
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<td>Medical data management</td>
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<td>MedCo&lt;br&gt;Pryv</td>
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<td>Biometrics</td>
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<td>Global ID&lt;br&gt;OneVisage</td>
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<td>Artificial intelligence</td>
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<td>LinkAlong&lt;br&gt;Nviso&lt;br&gt;PredictiveLayer&lt;br&gt;Privately</td>
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<tr>
<td>Security infrastructure</td>
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<td>Cysec&lt;br&gt;Guardtime&lt;br&gt;Metaco</td>
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<tr>
<td>Management of computer systems</td>
<td>Knowledge of real-time computer systems</td>
<td>EPFL Smart Grid&lt;br&gt;Hacknowledge&lt;br&gt;Nextthink</td>
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<tr>
<td>Information security</td>
<td>Intrusion detection, security management</td>
<td>Cyber-Defence Campus (EPFL) &lt;br&gt;École des sciences criminelles (UNIL) &lt;br&gt;Kudelski&lt;br&gt;Navixia&lt;br&gt;Prodaft&lt;br&gt;Teserakt&lt;br&gt;.snap Switzerland</td>
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<tr>
<td>Malware detection</td>
<td></td>
<td>Cyberhaven</td>
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<td>IT security</td>
<td>Fraud detection</td>
<td>NetGuardians</td>
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<tr>
<td>Security software</td>
<td>Application enhancement</td>
<td>ELCA&lt;br&gt;IICT (HEIG-VD)&lt;br&gt; Sysmosoft</td>
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<tr>
<td>Product counterfeiting</td>
<td>Security tags</td>
<td>AlpVision&lt;br&gt;Kao6sID&lt;br&gt;ScanTruSt&lt;br&gt;SICPA</td>
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AREAS OF INNOVATION

The canton of Vaud specialises in nine cutting-edge fields where pioneering companies and research institutes are being developed.

### Blockchain & Smart Contracts

The blockchain is an information storage and transfer technology whose management is handled by a network of interconnected computers, which store data in a distributed manner. The whole system is secured by cryptography. Smart contracts are based on this process to facilitate the negotiation or implementation of a contract. During its execution, all the validation steps are recorded to secure the data and prevent their modification or deletion.

### RESEARCH INSTITUTES

<table>
<thead>
<tr>
<th>EPFL</th>
<th>C4DT</th>
<th>Center for Digital Trust</th>
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<tbody>
<tr>
<td></td>
<td>Cyber-Defence Campus</td>
<td>Technology transfer with the Department of Defence</td>
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<td></td>
<td>DEDIS</td>
<td>Decentralized and Distributed Systems</td>
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<td></td>
<td>DSLAB</td>
<td>Dependable Systems Lab</td>
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<td></td>
<td>LACAL</td>
<td>Laboratory For Cryptologic Algorithms</td>
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<td>LIS</td>
<td>Laboratory of Intelligent Systems</td>
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<td>LASEC</td>
<td>Security and Cryptography Lab</td>
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<td>LEARN</td>
<td>Center for learning sciences</td>
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<td></td>
<td>Smart Grid</td>
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<td></td>
<td>SDSC</td>
<td>Swiss Data Science Center</td>
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<tr>
<td>HEIG-VD</td>
<td>IICT</td>
<td>Institute of Information and Communication Technologies</td>
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<td>Y-Security</td>
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<td>IDIAP</td>
<td>Biometrics Security and Privacy Group</td>
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<td></td>
<td>Swiss Center for Biometrics Research and Testing</td>
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<tr>
<td>POLICE</td>
<td>3C</td>
<td>Centre de compétence Cyber</td>
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<td>SICPA</td>
<td>Square One</td>
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<tr>
<td>UNIL</td>
<td>ESC</td>
<td>École des sciences criminelles</td>
</tr>
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</table>

### RESEARCH INSTITUTES | 7

- EPFL: DEDIS, DSLAB, LACAL, LIS, LASEC
- HEIG-VD: IICT, Square One

### START-UP | 12

- Ambrosus, Atracsys, Fundo, Guardtime, Inpher, Ledgity, Metaco, Olympe, Peerspoint, Pikcio, SecuTix, Zenum
Cryptography
A discipline of cryptology, cryptography is concerned with protecting messages using a secret code. This system ensures the confidentiality, authenticity and integrity of a message by making it totally unreadable except to the previously defined recipient. In recent years, cybersecurity has become increasingly important at all levels. In companies, for example, managers are responsible for the integrity and confidentiality of the data circulating for their business.

Computer security system (Cybersecurity)
Cybersecurity refers not only to methods of managing risks in the digital environment but also to all laws, best practices and security technologies. Protection will affect not only users but also all tangible and intangible IT assets (such as the cloud), connected directly or indirectly to a network. It, therefore, aims to defend these resources against cyber-attacks throughout the entire process.

RESEARCH INSTITUTES | 11
3C
EPFL:
C4DT, Cyber-Defense Campus, DEDIS, DSLAB, LACAL, LASEC, SDSC
HEIG-VD:
IICT, Y-Security
Square One
START-UP | 7
Cysec, Guardtime, ImmuIT, Inpher, Neutrality, NextDayVision, Zaphiro Technologies
SMES AND LARGE COMPANIES | 9
ABISSA Informatique, BrainHolding, Brainserve, Cisco, ELCA Informatique, Navixia, NetGuardians, NEXThink, SCRT

RESEARCH INSTITUTES | 11
3C
EPFL:
C4DT, Cyber-Defense Campus, DEDIS, DSLAB, LACAL, LASEC, SDSC
HEIG-VD:
IICT, Y-Security
Square One
START-UP | 6
Guardtime, Metaco, ProtonMail, Quantum Integrity, SYMOSOFT, Teserakt
SMES AND LARGE COMPANIES | 6
ID Quantique, Regdata, SICPA, Swisscom, Swissquote, Twint
Digital investigation and resilience
Digital forensics is a field of activity that consists of using specialised techniques in the research, collection and analysis of data from digital media. In particular, it is used in court cases to study and learn about events that have taken place. Started at the end of the 1970s, it became an industry in its own right in the 2000s.

Digital information
In computing, digital information is interpreted and put into context in a program. This data can thus be stored and classified in different forms: textual, digital, images and sounds.

RESEARCH INSTITUTES | 7
EPFL: C4DT, Cyber-Defense Campus, LIS, SDSC, Smart Grid
HEIG-VD: IICT
START-UP | 4
Frontiers Media, Goodwall, LEDsafari, Nanoga
SMES AND LARGE COMPANIES | 5
La Mobilière, Navixia, Open Web Technology, SwissRe, Tetrapak
INTERNATIONAL ORGANISATIONS | 2
International Telecommunication Union (ITU), ICON

RESEARCH INSTITUTES | 2
EPFL Cyber-Defense Campus
UNIL ESC
START-UP | 3
Cyber Resilience Suisse, Morphotonix, Seculting
SMES AND LARGE COMPANIES | 3
Advanced Track & Trace, Hacknowledge, Omnisens
INTERNATIONAL ORGANISATIONS | 2
International Committee of the Red Cross (ICRC), The International Cyber Policing Organisation (CYBERPOL)
Digital Governance
Digital governance (or Internet governance) is the joint development and implementation by governments, the private sector, civil society and the technical community, who in their respective roles share principles, norms, rules, decision-making processes and activities to shape the evolution and use of the Internet.

Machine Learning
Machine learning aims to automate the statistical analysis of large complex data sets using adaptive calculation. As a form of artificial intelligence, machine learning effectively automates the process of creating analytical models and enables machines to adapt to new scenarios independently. It is a central strategy to meet the increasing needs of science and applications.

RESEARCH INSTITUTES | 1
EPFL: C4DT

INTERNATIONAL ORGANISATIONS | 4
Cyberpeace Institute, Internet Governance Forum (IGF), Swiss Digital Initiative, Diplo Foundation

RESEARCH INSTITUTES | 4
EPFL: LIS, LEARN, SDSC, Smart Grid

START-UP | 16

SMES AND LARGE COMPANIES | 2
eSMART, Pix4D
**Data protection**
Personal data concerns all information about a natural or legal person that identifies him or her or indirectly allows his or her identification. Personal data are considered sensitive when they relate to health, including biometric and genetic data, opinions and policies, trade union, religious, intimate life, ethnic origin, social welfare measures and criminal and administrative sanctions. In this sense, data protection is the security and non-violation of personal information.

**Software verification and security**
Software security concerns all the technical and organizational means required to implement tools that prevent unauthorized use, modification or misuse of an information system. Verification, for its part, makes it possible to check the security of a device continuously.

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**RESEARCH INSTITUTES | 5**
- **3C**
  - EPFL: C4DT, DLSLAB, LACAL, LASEC
  - HEIG-VD: IICT, Y-Security
  - IDIAP: Biometrics Security and Privacy Group
  - Square One

**START-UP | 10**
- Global ID, Megaverse, NextPrivacy, NoisyPeak, OneVisage, Pryv, SWISSMEDBANK, SwissSign, zebiometrics

**SMES AND LARGE COMPANIES | 5**
- Bacula Systems, Guardtime, Kudelski Security, Navixia, Snap Suisse

**INTERNATIONAL ORGANISATIONS | 2**
- Geneva Centre for Security Policy (GCSP), World Economic Forum (WEF)
- Global Centre for Cybersecurity

**RESEARCH INSTITUTES | 11**
- **3C**
  - EPFL: C4DT, Cyber-Defense Campus, DEDIS, DLSLAB, LACAL, LASEC, SDSC
  - HEIG-VD: IICT, Y-Security
  - Square One

**START-UP | 5**
- Alpvision, CYBERHAVEN, Guardtime, Geosatis, ScanTrust

**SMES AND LARGE COMPANIES | 4**
- Calcom, Navixia, SERIAL, SGS

**INTERNATIONAL ORGANISATIONS | 1**
- DONA Foundation
RESEARCH AND DEVELOPMENT

EPFL – Laboratory for Cryptologic Algorithms
This laboratory specialises in the design and analysis of algorithms used in cryptographic protocols or security assessments.
lacal.epfl.ch

EPFL – Laboratory of Intelligent Systems
The laboratory studies the future of artificial intelligence and robotics in the fields of biology and engineering, man and machine.
epfl.ch/labs/lis

EPFL – Center for learning sciences LEARN
The centre aims to support the excellence of the Swiss education system and the digital transformation of society.
epfl.ch/education/educational-initiatives/home

EPFL – Security and Cryptography Lab
Teaching and research in the laboratory are focused on communication and information systems security, cryptography and applications.
lasec.epfl.ch

EPFL Smart Grid
The project aims at inventing innovative methods to combine information and communication technologies with new electrical devices capable of storing energy.
smartgrid.epfl.ch

EPFL – Dependable Systems Lab
The laboratory is dedicated to techniques for building reliable computer systems.
dslab.epfl.ch
Y-SECURITY

As a major player in the field of cybersecurity, HEIG-VD has strengthened its position with its Y-Security competence centre. Under the impetus of the professors and the HEIG-VD IT Security team, Y-Security brings together the various University institutes to address cybersecurity in cross-disciplinary fields such as medical, bioinformatics, industry 4.0, internet objects, energy and business models. This skills cluster is at the centre of a unique local ecosystem with the HEIG-VD, the Y-Parc innovation park and the companies housed there. Y-Security has forged close links with major players such as Kudelski and the publisher Snap, but also with numerous Swiss and European industries in the field of applied cybersecurity. The Y-Security members are also the organisers of Black Alps, the largest technical conference in the field of cybersecurity in Switzerland.

“The stakes and challenges of digital trust are bringing together the skills of public, private and academic actors. The HEIG-VD is pleased to contribute to the Trust Valley in strong collaboration with other academic partners, by bringing its expertise in cybersecurity to research projects applied in partnership with economic actors.”

CATHERINE HIRSCH, Directrice de la HEIG-VD
Nearly four out of five Swiss companies believe that the importance of cybersecurity topics has increased in their company in recent months.

78%

“The Trust Valley brings together academic institutions and companies to develop security, a sine qua non of trust, in the digital age. The University of Lausanne will contribute to this effort through its integrative approach to cybersecurity and digital trace, which includes technical aspects as well as ethical, legal, judicial and criminological issues.”

NOURIA HERNANDEZ, Rectrice de l’Université de Lausanne

Idiap Research Institute – Biometrics Security and Privacy Group
Idiap is a non-profit research foundation affiliated to the EPFL. It is dedicated to research, training and technology transfer in the fields of multimedia information management, perceptual and cognitive systems and biometric person recognition. Its Swiss centre for research and testing in biometrics collaborates with Google, which has chosen Idiap as its sole European partner in the Abacus research project.
idiap.ch

Idiap Research Institute – Swiss Center for Biometrics Research and Testing
As a centre of excellence in biometrics, the structure promotes collaboration between the academic and industrial worlds.
biometrics-center.ch

University of Lausanne – School of Criminal Sciences
The School of Criminal Sciences carries out research and teaching activities in the field of digital criminal sciences.
unil.ch/esc
ESTABLISHED BUSINESSES AND STARTUPS

Abissa Informatique
Based in Renens, the company designs, implements and maintains pragmatic, reliable and high-performance IT solutions.
abissa.ch

Adeya
The start-up helps governments and businesses to secure their sensitive national information that is shared on smartphones such as email or encrypted file sharing in closed circles.
adeya.ch

Advanced Track & Trace
For 25 years, this world leader has been a technology provider in the field of brand protection, secure traceability and authentication.
att-en.com

Aicrowd
Aicrowd is an EPFL spin-off, which enables the best machine learning models to be found via a crowdsourcing competition directed at the worldwide community of researchers. The SBB used it to optimise their timetables, for example.
aicrowd.com

AlpVision
Based in Vevey, AlpVision specialises in the protection of trademarks against fraudulent attacks and counterfeiting. It produces software and authentication solutions.
alpvision.com

Ambrosus
Ambrosus is a blockchain-based solution designed for companies in the food and pharmaceutical sectors. By combining high-tech sensors, a blockchain protocol and intelligent contracts, the young company is building a universally verifiable and community-driven ecosystem to ensure the quality, safety and origin of products.
ambrosus.com

GUARDTIME
Founded in 2007, Guardtime develops blockchain-based digital signature software. It is now hosted within SICPA's Square One campus. Among its customers, the Estonian-based company counts the U.S. Military Research and Development Agency (DARPA) among its clients. Thanks to Guardtime, Estonia is the most digitized country in the world as all government and medical data is protected by the startup's solutions.

ASANA Technology
Based in Pully, the company develops and markets a unified system (hardware and software) mainly for intelligent cars.
asanatechnology.com

Astrocast
Astrocast offers a network of nanosatellites providing “machine-to-machine” (M2M) services to international companies.
astrocast.com

Attolight
Created in 2008, Attolight develops innovative tools and solutions for research laboratories and the semiconductor industry.
attolight.com
NAVIXIA
Navixia specialises in securing companies’ information systems, particularly in the analysis, limitation and management of risks. Navixia helps SMEs and multinationals to identify their critical resources and measure the real risk to their business. It analyses their security level and offers them solutions specifically adapted to their environment. Its activities focus mainly on safety audits and risk mapping, offering tailor-made solutions and services, training, awareness-raising (in particular via the DiagnoPhish platform) and technology watch.
navixia.com

Atracsys
Based in Puidoux, Atracsys has developed a system that allows surgeons to be guided by triangulation in the operating field. In June 2019, the company was acquired by the British group Smith & Nephew.
atracsys-measurement.com

Bacula Systems
Based in Yverdon-les-Bains, the company provides its customers with backup and recovery management solutions across multiple networks.
baculasystems.com

BrainServe
Based in Crissier, the BrainServe data centre provides hosting services mainly to banks, international companies and IT service providers.
brainserve.ch

Cisco
Founded in 1984, Cisco integrates a comprehensive portfolio of security technologies to provide advanced protection against computer threats
cisco.com

Cyber Resilience Switzerland
Working with several technologies and solutions, Cyber Resilience has developed a comprehensive cyber programme to guide customers step-by-step through a methodology designed to increase their resilience and maturity in the field of cybersecurity.
ocyber-resilience.net

Cysec
Based at EPFL, the start-up has developed a security platform, capable of storing data and running applications in a trusted environment.
cysec.systems

Cyberhaven
The company is developing innovative technology to secure data on terminals and servers in the Cloud.
cyberhaven.io

DEPsys
Guaranteeing a reliable and secure distribution of electricity at all times is the principle behind the technology developed by the start-up DEPsys, created in 2012 in Yverdon-les-Bains.
depsys.ch

ELCA
A long-established company in the canton of Vaud, ELCA is active in IT business consulting, software engineering and systems integration. The company has designed custom and standard solutions for more than 1,000 clients over the past ten years and contributes to the success of the Center for Digital Trust (C4DT) at the EPFL.
elca.ch
SNAP SWITZERLAND
It is a beautiful “success story” in the real sense of the word. A spin-off from the Vaud University of Engineering and Management (HEIG-VD), the young company strong.codes was acquired by Snap, the American publisher of the Snapchat mobile application, in December 2016. It was directly integrated into the Swiss subsidiary, Snap Switzerland. For Laurent Balmelli, co-creator of the company based in Y-Parc (Yverdon-les-Bains), this acquisition is explained because of the quality of our technology and the level of security we provide. Indeed, the young company has specialised in the field of software protection. Its flagship product, strong.protect, offers a solution that enables software application developers to effectively protect their intellectual property against reverse engineering, illegal modification and distribution.

Fastree3D
Spin-off from EPFL, Fastree3D has developed fast 3D space sensors for industrial and automotive applications.
fastree3d.com

Flyability
Flyability designs safe, collision-tolerant robots to inspect inaccessible areas, replacing dangerous human intervention with unmanned robots.
flyability.com

Frontiers
An open access, community-based academic publisher, Frontiers is an Open Science platform where anyone can search, share and generate knowledge.
frontiersin.org

Fundo
Fundo specialises in understanding and managing risks associated with institutional clients’ funds. Its asset management services are mainly oriented towards Swiss and international pension funds.
fundo.ch

“In the age of digitisation, artificial intelligence and dematerialisation, it is more essential than ever to equip ourselves with the technological tools that guarantee trust. Our region, our universities and our companies are leaders in these essential issues. The ELCA Group is proud to bring its contribution to this common endeavour, a creator of value and highly skilled jobs.”

CÉDRIC MORET,
Directeur général du groupe ELCA
Future Instruments
A spin-off from HEIG-VD, the company develops innovative man-machine interfaces. Its MultiTouch Everywhere technology makes it possible to transform any surface into a multi-touch multipoint interface.

Gamaya
Born on the EPFL campus, Gamaya specialises in remote sensing cameras capable of carrying out large-scale crop diagnosis from drones.

Geosatis
Based in Le Noirmont, Geosatis, created in 2011, manufactures electronic bracelets for prisoners, combining GPS and radiofrequency.

Global ID
The main objective of Global ID is to bring innovative technology to the market that reliably identifies people using 3D biometric data based on the structure of veins.

Goodwall
Goodwall is the first social network where 14 to 19-year-olds are connected and guided to the right universities and companies; they get support and connections from teenagers who share their ideas and find ways to improve themselves, win scholarships and prizes.

Hacknowledge
Launched in 2016 by the former founder of SRCT, Hacknowledge offers security monitoring services and provides a turnkey offer covering surveillance, detection of cybersecurity risks and response to threats, focusing on the elimination of false alarms.

Immunit
Based in Nyon, immunit specialises in information systems security. Its mission is to help companies protect themselves against the risks inherent to their information systems and to accompany them in the process of continuous improvement.

Inpher
Inpher’s Computing technology enables advanced research and analysis to be carried out on encrypted data without revealing it. Large companies in regulated sectors are taking advantage of this ability to safely outsource workloads to the cloud and build learning machine models that comply with the protection of privacy and sensitive data.

KaiosID
With its innovative solution for product traceability in packaging, the start-up helps brands to fight against counterfeiting.

Kudelski
In Cheseaux-sur-Lausanne, Kudelski is active in digital security and media solutions. It is the originator of the first portable audio recorders and television decoders.

Kudelski Security
Kudelski Security is an international cybersecurity company that provides innovative, independent and tailor-made solutions to large corporations and public sector clients.
Ledgity
Bringing the financial world and the blockchain closer together, Ledgity offers a platform dedicated to peer-to-peer exchange through an intuitive mobile application. All users have access to a technology that is 100% compliant with the laws and regulations applicable to the financial markets.
ledgity.ch

LEDSafari
LEDsafari offers a low-cost solar lamp that you can make yourself. It also has an online training platform for companies and organisations.
english.ledsafari.com

LinkAlong
LinkAlong is developing technology to extract “critical” facts from the social web and track “relevant” information in real time. Its solutions based on semantic analysis, deep-learning and engineering are used to solve problems in the fields of security, health, finance, media or marketing.
linkalong.com

Megaverse
Thanks to gamification, Megaverse has launched an adaptive learning platform, which aims to provide cybersecurity training to employees in a fun and interactive way.
megaverse.com

MedCo
Based at EPFL, MedCo uses a system to protect sensitive patient data – including genetic information - so that it can be used for medical research.
medco.epfl.ch

Metaco
The start-up specialises in blockchain technologies and digital asset management. In particular, it has developed a safe for cryptocurrency and crypto-actives for the financial sector.
metaco.com

Morphotonix
The Vaud-based start-up has developed a nano engraving technology for plastic injection moulds. Without any additives, this makes it possible to mass-produce visible or invisible holograms in products or packaging to distinguish them.
morphotonix.com

Nanoga
Vaud-based start-up Nanoga has designed a solution to convert any television into an interactive screen
nanoga.com

“Trust is the basis of all social, economic and political relations. Winning it in the digital world is one of the main challenges for the future. The creation of the Trust Valley thus responds to a fundamental need based on the exceptional academic and economic environment of the Lake Geneva region. The Kudelski Group is committed to being one of the founding members of the Trust Valley and to making its expertise available.”

ANDRÉ KUDELSKI,
Chief Executive Officer
of the Kudelski Group
NetGuardians
Established at Y-PARC and specialising in fintech, NetGuardians develops a platform for fighting fraud and digital compliance.
netguardians.ch

Nexthink
Nexthink offers large companies solutions for managing their digital experience, providing them with the information they need to help their customers limit their costs, reduce their IT problems and ensure the security of their data.
nexthink.com

NoisyPeak
The start-up is a leading provider of advanced video solutions for television/video broadcasters, as well as for corporate, government, professional sports and educational applications.
noisypeak.com

NVISO
This Lausanne-based start-up specialises in artificial intelligence and deep learning for facial recognition. In particular, it has entered into a strategic partnership with ePat, an Australian publisher of health applications.
nviso.ai

Olympe
The platform developed by Olympe allows users to create software without writing code, even for industrial systems. The start-up is working with multinational companies such as Givaudan and SICPA, which use the platform to converge their supply and production chains towards the Internet of Things. Olympe uses blockchain to guarantee very high-security standards to its customers.
olympe.ch

Omnisens
Omnisens is a world leader in the field of high-performance fibre optic surveillance to protect critical resources and avoid the increasingly severe consequences of late incident detection.
omnisens.com

OneVisage
The company offers 3D facial recognition services on mobile devices.
onevisage.com

Open Web Technology
This strategy and technology consulting firm specialises in digital transformation
openwt.com

Peerspoint
Peerspoint Sport is the first blockchain-based ecosystem dedicated to sports and leisure federations. Its solution takes care of administrative tasks, CRM, security and financial flows between the members of a sports or leisure federation. Using blockchain technology, information and validations are transmitted faster while being digitised (licences, match sheets, subscriptions...).
peerspoint.com

Pikcio
Developed in Lausanne, the Pikcio solution enables the collection, certification and exchange of personal data. It protects individual and personal data while facilitating data acquisition and management for companies. PiKcio provides the world’s first monetised personal data market.
pikcio.com

Predictive Layer
The company offers state-of-the-art services in automated predictive analytics. Using artificial intelligence and machine learning, it processes customer data by correlating it with open data before establishing solutions.
predictivelayer.com
<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
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<tbody>
<tr>
<td>Privately</td>
<td>The start-up designs online safety solutions for the protection of children.</td>
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<tr>
<td>Prodaft</td>
<td>Focused on high-end areas of security, Prodaft offers its services to government agencies and private organisations with success.</td>
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<tr>
<td>ProtonMail</td>
<td>Launched in 2014, ProtonMail is the world’s largest secure messaging service developed by CERN and MIT scientists.</td>
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<tr>
<td>Pryv</td>
<td>Pryv presents compliant data management software solutions in the field of Digital Health.</td>
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<tr>
<td>Quantum Integrity</td>
<td>Quantum Integrity has developed a technology to detect, quantify and qualify all manipulations performed on a digital image.</td>
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<tr>
<td>Regdata</td>
<td>Based out of Epalinges, Regdatat’s solution uses state-of-the-art cryptography to provide encrypted, anonymised and pseudonymised data throughout the communication flows.</td>
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<td>Revapost</td>
<td>The company offers services to secure email exchanges using military-grade encryption</td>
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<tr>
<td>ScanTrust</td>
<td>Located at the EPFL Innovation Park, the company specialises in the manufacture of secure QR codes, to authenticate products and protect against counterfeiting.</td>
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<tr>
<td>SCRT</td>
<td>SCRT is one of the leading players in the Swiss security market. The company offers training, auditing services and intrusion and attack-defence tests.</td>
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<tr>
<td>Seculating</td>
<td>The start-up helps SMEs, IT service providers and insurance companies to assess their risk level or that of their clients/partners.</td>
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<tr>
<td>SecuTix</td>
<td>SecuTix helps sports, cultural and leisure organisations to manage their ticketing with SecuTix 360®, a paperless platform that combines ticketing and marketing functionalities, offered as a white label. Used by the largest sports clubs and stadiums, entertainment companies and Europe’s leading museums and cities, SecuTix manages the annual sale of more than 45 million tickets.</td>
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<tr>
<td>senseFly</td>
<td>The large-scale geospatial data collection and analysis solutions developed by senseFly, dedicated to UAVs, serve as decision support tools for farmers.</td>
</tr>
<tr>
<td>SERIAL</td>
<td>Founded in 1986, the computer engineering company specialises in cybersecurity and digital transformation, among others.</td>
</tr>
</tbody>
</table>
SGS
The world leader in risk quantification and qualification is investing in general aviation and remote-controlled aircraft (RPAS).
sgs.com

SICPA
SICPA is the world leader in secure authentication, identification and traceability solutions and services.
sicpa.com

Snap Switzerland
A spin-off from HEIG-VD, strong.codes develops solutions to protect the code of an application. It was acquired by Snap, the Swiss subsidiary of Snapchat.
snap.com

Swisscom
The company is majority-owned by the Swiss Confederation and is the leading company in the Swiss telecommunications market.
Swisscom.ch

Swissdecode
As a spin-off from the University of Geneva, the company has developed tests to analyse food’s DNA in thirty minutes.
swissdecode.com

SWISS MEDBANK
SWISS MEDBANK presents technologies and services to facilitate access to a patient’s health information in a secure manner to doctors worldwide in the fastest possible way.
swissmedbank.com

Swissquote
A pioneering bank in online trading, Swissquote has since expanded its product portfolio. In particular, it offers the possibility of investing in several cryptocurrencies under an agreement with Luxembourg-based European leader in fintech, Bitstamp. It is also the first Swiss bank to offer its clients the opportunity to participate in blockchain-related equity financing.
swissquote.ch

SwissSign
SwissSign Group, the publisher of SwissID, is a joint venture active in the field of digitisation and data protection, consisting of companies close to the state, financial institutions, insurance companies and health insurance companies.
swisssign.com

“When trust is there, the collective benefit is substantial. Confidence in economic and social relations is a key driver of growth in both normal conditions and in times of crisis. It must promote an inclusive, transparent and accountable economy and society. We are committed to developing and promoting new trust technologies to achieve this ambitious vision.”

PHILIPPE AMON,
Managing Director of SICPA
Sysmosoft
The spin-off of HEIG-VD offers an electronic signature solution for digitising processes related to banking transactions.
sysmosoft.com

Teserakt
The start-up has developed software to encrypt the communications of objects and machines connected to each other.
teserakt.io

Twint
The company is the creator of the application of the same name which serves as a digital wallet for the majority of Swiss banks, allowing money to be transferred between private individuals.
twint.ch

Zaphiro Technologies
The company is developing power distribution management software to facilitate generation integration and decentralised storage.
zaphiro.ch

Zenum
The Lausanne-based start-up combines biometrics and blockchain to replace identity documents.
zenumtechnologies.com
NETWORK OF SUPPORTING PARTNERS

**Alp ICT**
As a support platform for start-ups and SMEs in Western Switzerland, Alp ICT assists numerous actors in the field of cybersecurity and digital technologies.
alpict.com

**Biopôle**
An innovation park entirely dedicated to life sciences, the Biopôle is home to more than 50 companies and institutes – including several head offices of multinationals as well as innovative SMEs - representing more than 1,200 professionals. Inaugurated in 2004, the centre hosts the Digital Health Hub collaborative network which promotes the integration of digital technologies in the life sciences sector. It thus contributes to the establishment of digital trust in the health sector.
biopole.ch

**CyberPeace Institute**
This organisation aims to assist victims of cyber attacks, to advocate transparency and to promote international discussions on behaviour in cyberspace. To this end, the centre aims to facilitate collective analysis, research and investigation (including damage assessment) on cybercrimes. For companies, this will enable the organisation to determine what behaviour to adopt and avoid attacks such as "ransomware".
cyberpeaceinstitute.org

**Cautionnement romand**
The organisation supports any project for the creation, development, takeover or succession of a company by financing machinery, tools, equipment, stocks or working capital, through bank loans, for a maximum period of ten years - depending on the project - and not exceeding CHF 1 million.
cautionnementromand.ch

**digitalswitzerland**
As an interprofessional association, digitalswitzerland carries the shared vision of its members to strengthen Switzerland’s position as a hub for digital innovation and to ensure that all Swiss industries benefit from it.
digitalswitzerland.com

**EPFL Innovation Park**
The EPFL Innovation Park welcomes technology-oriented companies in a stimulating environment, with access to cutting-edge research, a vast network of dynamic entrepreneurs and established companies. It is currently home to more than 120 start-ups, 26 large companies and around 20 service providers.
epfl-innovationpark.ch

**Fondation pour l’Innovation Technologique (FIT)**
FIT provides grants and loans (ranging from CHF 100,000 to CHF 500,000) to support the development of innovative technological projects at various stages of their development.
fondation-fit.ch

**Innovaud**
resulting from the merger of Economic Development – Canton of Vaud (DEV) and Innovaud, the new entity Innovaud combines the promotion of foreign investment and the promotion of innovation to further target the needs of the Vaud ecosystem, as well as those of companies. The structure targets companies wishing to set up in Vaud, new start-ups or SMEs that are innovating and developing in promising fields such as cybersecurity, food tech or oncology. Innovaud works closely with the SPEI.
innovaud.ch

**International Risk Governance Council (IRGC)**
The IRGC structures risk governance for infrastructure residency and cybersecurity of the Internet of Things.
irgc.org
SQUARE ONE –
A campus dedicated to the innovation of the trust economy
SICPA reconciles physical and digital security. To do this, the multinational based in the canton of Vaud developed the idea of the Square One campus. This project has three objectives: becoming a Mecca for the trust economy, offering physical and digital meeting places for different partners to develop ideas related to the field, and finally to encourage the development of the first professional network focused on ethical and sustainable technologies for the trust economy. With a space of 30'000 m² in the first phase, the structure will attract international companies as well as universities and visionary entrepreneurs who will work together on the protection of goods, people and data.

THREE QUESTIONS TO PHILIPPE GILLET, DIRECTOR OF THE SQUARE ONE PROJECT

What are the advantages of the Square One project?
The Innovation Campus, proposed by an industrial group in the heart of the canton of Vaud, has a vision of the future where economy and trust are reconciled. This dynamic ecosystem fosters innovation, collaboration, training and information, thanks to a network of technology suppliers and users who can co-develop, test and prototype together.

How is Square One organised?
Square One can accommodate dozens of start-ups. Eventually, we can envisage some 3,000 people working on the site. There will also be co-working spaces for innovation based on the Fabs Labs model. We encourage those who wish to join us with their ideas and participate in the creation of a new international community around the economy of trust. In addition, we are consolidating interaction with the canton, academic partners such as the EPFL and companies of various sizes.

Why did you decide to establish a long-term presence in the canton of Vaud?
This project is driven by SICPA’s vision, which has already been established in the region for more than 90 years. There is, therefore, no question of going elsewhere. There are many companies, top-level universities, start-ups and numerous experts in the digital sector: security of physical assets, IT and traceability, who want to participate in the development of new services and new products oriented towards trust.
INTERNET GOVERNANCE FORUM
This platform brings together all internet governance stakeholders to facilitate reflection and discussion on digital policies.
intgovforum.org/multilingual

MELANI
The Reporting and Analysis Centre for Information Assurance MELANI brings together partners working in the field of computer systems and Internet security as well as the protection of national and critical infrastructures.
melani.admin.ch

Office for Economic Affairs and Innovation (SPEI)
The SPEI supports companies established in the canton of Vaud, particularly those active in the industrial and high-tech sectors. The SPEI advises and informs entrepreneurs, in particular by putting them in touch with the appropriate organisations. The SPEI can also provide direct financial support.
vaud-economie.ch

Trust Valley
The Trust Valley is an alliance aimed at promoting all the expertise in the Lake Geneva region in the field of digital trust and cybersecurity and digital trust. Public authorities, academic institutions and economic actors are committed to fostering the emergence of innovative projects.
trustvalley.tech

Vigiswiss
Created to preserve universal digital memory, Vigiswiss is the first certified network of companies active in data storage and protection in Switzerland.
vigiswiss.ch

Y-PARC
Y-PARC is one of the largest innovation centres in Switzerland. Its proximity to the HEIG-VD enables it to welcome start-ups active in the digital field.
y-parc.ch

Source: Swissquote, magazine "Cybersecurity Trends"

![Image showing statistics]

260
is the average number of days that pass before a company realises that it has been hacked.

1700%
is the increase in the number of reports of cyber attacks in Switzerland since 1 January 2020.