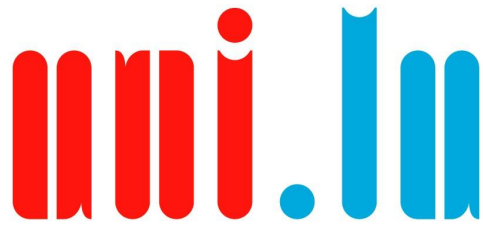


UNIVERSITÉ DU
LUXEMBOURG



UNIVERSITÉ DU
LUXEMBOURG

Incident Management

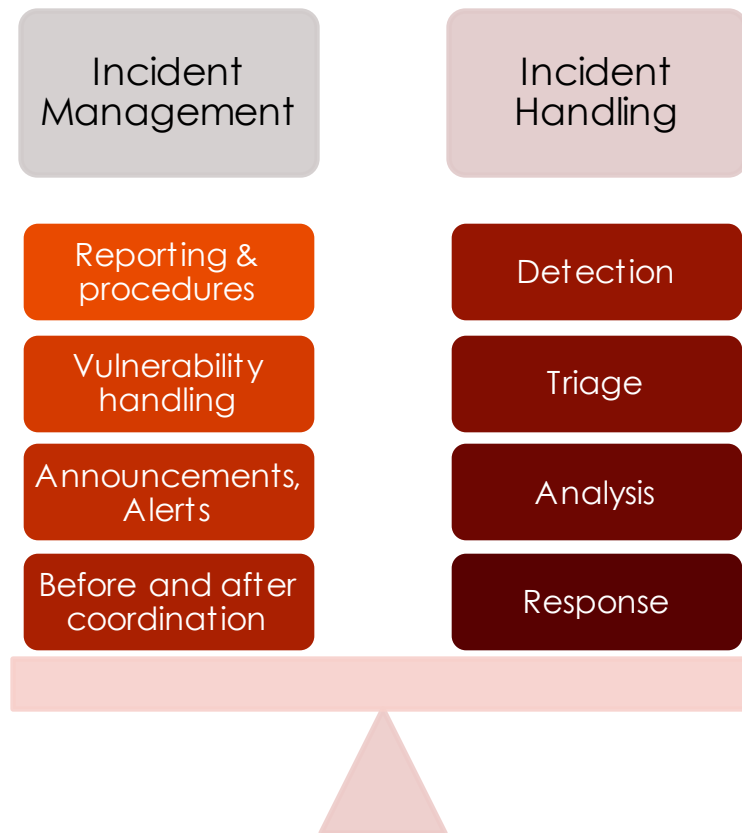
in the context of an Information Security
Policy

Master in Information System Security Management

Part 2

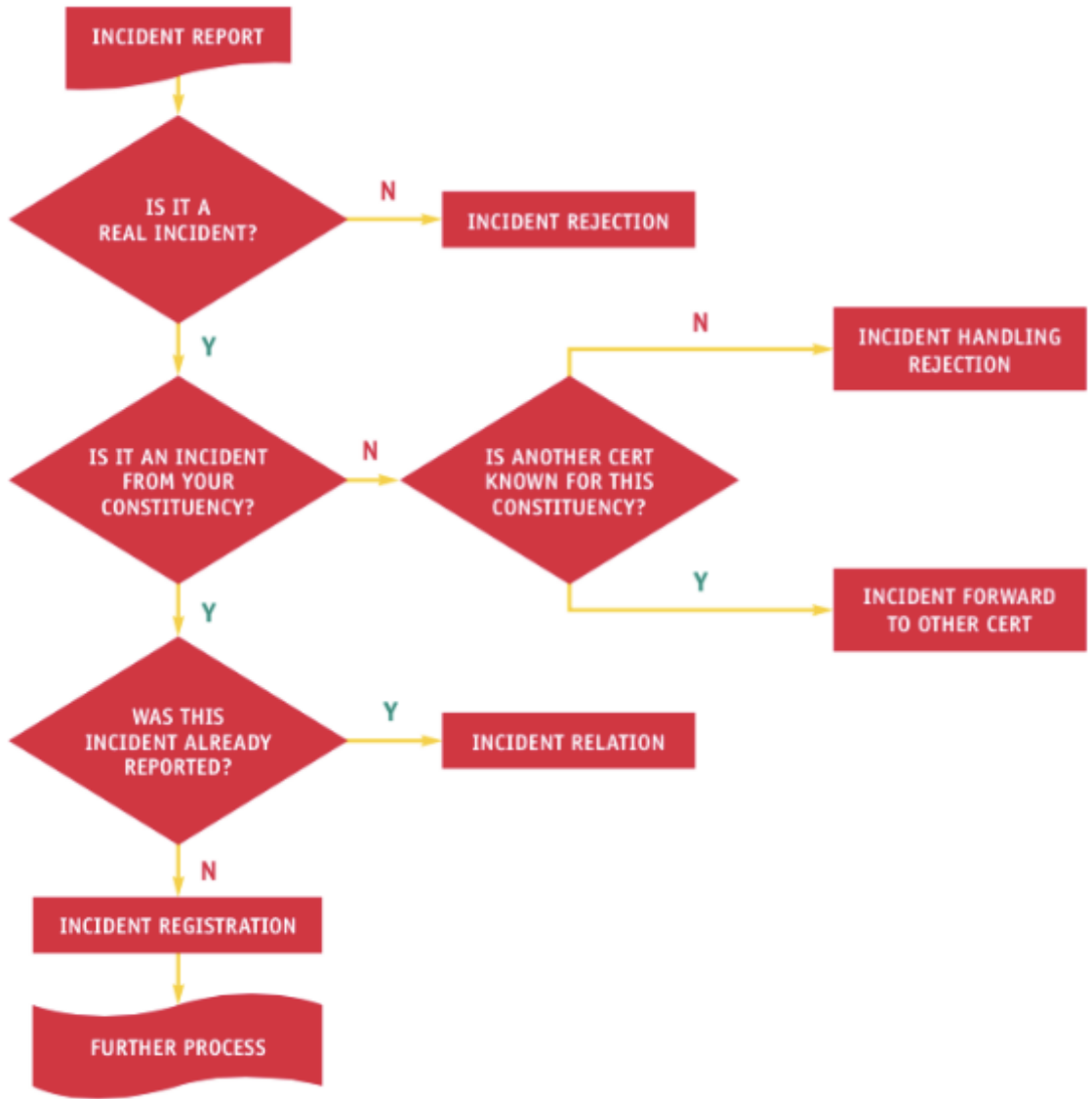
Incident **reporting, handling** and **resolution**

Management & Handling



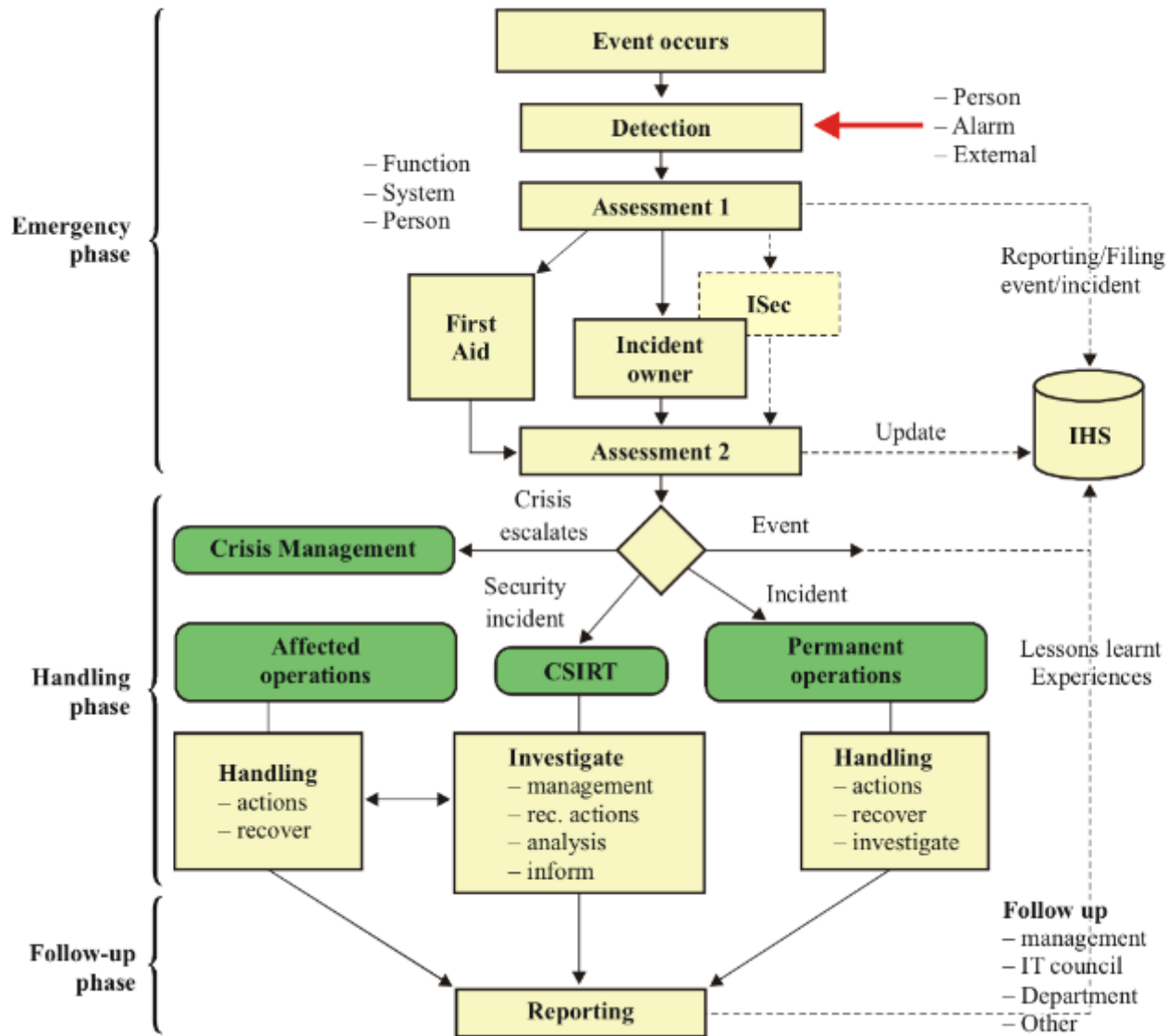
Reporting

Following: ENISA – Incident Management Guide



Handling

Following: ITU-T E.409 – Incident organization and security incident handling



Resolution Cycle

Following: ENISA – Incident Management Guide

Incident resolution cycle



(I) Data analysis - collection

- Information to get from the reporter:
 - detailed contact information
 - detailed description of the incident
 - incident classification suggested by the incident reporter
 - logs
 - the exact time of the incident
 - operating systems and network setup
 - security systems setup (eg, antivirus software or firewall)
 - incident severity (in the incident reporter's opinion)



(I) Data analysis - correlation

- Monitoring systems:
 - information related to the IP addresses involved in network monitoring systems (e.g., netflow database).
- Referring database:
 - check if this kind of incident or this incident reporter are already in your incident database.
- Other sources:
 - relevant log-files (routers, firewalls, proxy servers, switches, web application, mail servers, DHCP servers, authentication servers, etc.).



(II) Research resolution

- Based on analysis, team brainstorming on resolution
- Avoid the pitfall of perfectionism
- Sometimes a quick response has the same or a higher value than a comprehensive and complete understanding

ANALYSIS



**RESOLUTION
RESEARCH**

(III) Actions - preparation

- Prepare a set of concrete and practical tasks for each party involved
- Remember to adjust your language

ON
ERY



DATA

RE



**ACTION
PROPOSED**

(III) Actions - internal

- Attack target
 - How to stop and mitigate an ongoing attack:
 - turn off a service
 - check the system for malware
 - patch a system or an application
 - perform or order an audit if you are not able to improve your system security yourself
 - How to deliver more data:
 - concrete practical instructions (e.g. how to obtain a full e-mail header)

ON
ERY



DAT/

RE



**ACTION
PROPOSED**

(III) Actions - external

■ ISP/ICP

- To collect, save and archive data.
- To monitor network traffic related to the case and inform you if something important happens.
- To filter network traffic in the case of an ongoing attack if such filtering can help to stop or mitigate it.



RE



(III) Actions - external

- CERTs
 - To contact the local ISP/ICP within its constituency
 - To ask for advice on how to deal with an incident
- Law enforcement:
 - To follow a case if it is significant (e.g. you suspect organised crime activity)
 - To assist the reporter of a crime if an incident is to be reported to the police



RE



(IV) Monitor performance

- Basic rules for monitoring the performance of actions:
 - Is the attack target's service turned off?
 - Is the attack target's service still vulnerable?
 - Is the traffic which should be filtered still visible in the network?

ERADICATION
AND RECOVER



ACTION
PERFORMED



(V) Recovery

- Recover or restore to normal the service that was attacked during the incident

**ERADICATION
AND RECOVERY**

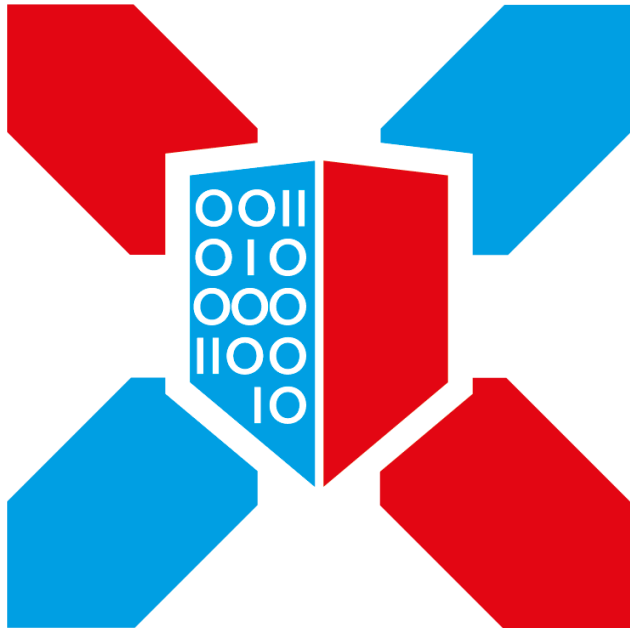


**ACTION
PERFORMED**



Incident closure, lessons learned & improvements

INCIDENT TARGET	ISP/ICP	CERTs	LEGAL	SOURCE OF INCIDENT
COLLECT ALL AVAILABLE LOGS	RETAIN LOGS	MEDIATE CONTACT TO THE LOCAL ISP/ICP	SHARE LEGAL ADVICE	LOG EVENTS
DESCRIBE AN INCIDENT	ASSIST IN OPERATIONAL ACTION	ADVICE IN SIMILAR CASES	SUPPORT LEGAL ACTION	SEARCH FOR SUSPICIOUS USERS
Teach an incident / advise how to avoid it	Explain the mechanism	Share a lesson learnt	Inform about a result / propose a legal action	Advise how to avoid being "an attacker"



CYBERSECURITY LUXEMBOURG

The Luxembourg Cybersecurity Ecosystem

*20 years of creating a culture of security
for economic and social prosperity*

WHERE IT ALL STARTED

“I LOVE YOU” VIRUS (2000)



TOWARDS A CULTURE OF SECURITY

OECD GUIDELINES FOR THE SECURITY OF INFORMATION SYSTEMS AND NETWORKS (2002)

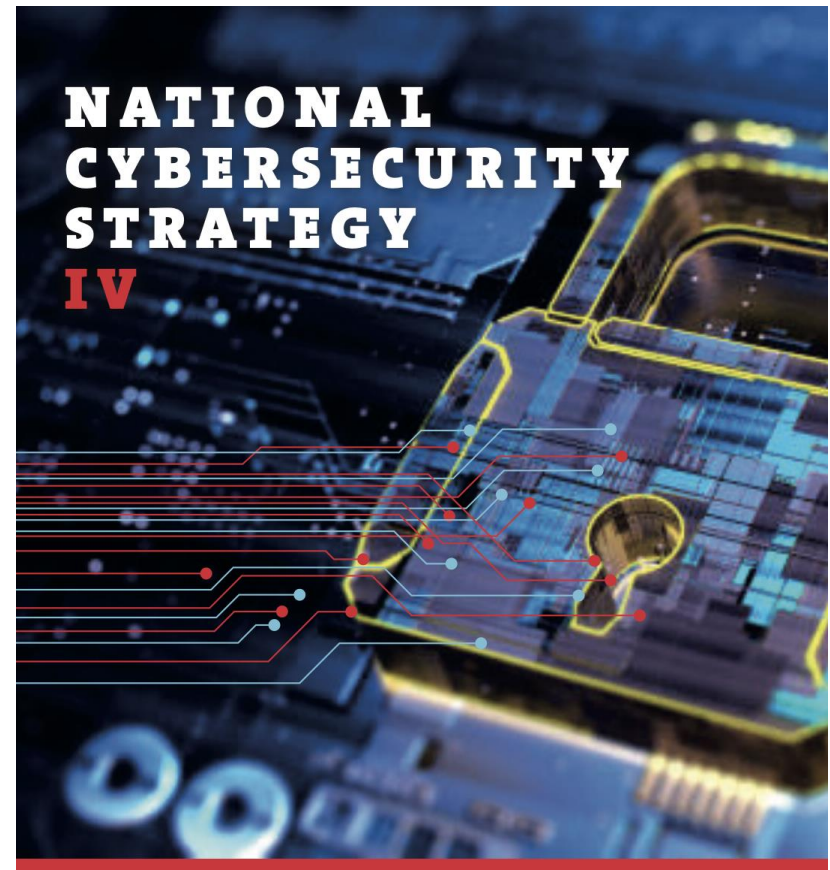


TODAY

NATIONAL STRATEGY

2021-2025

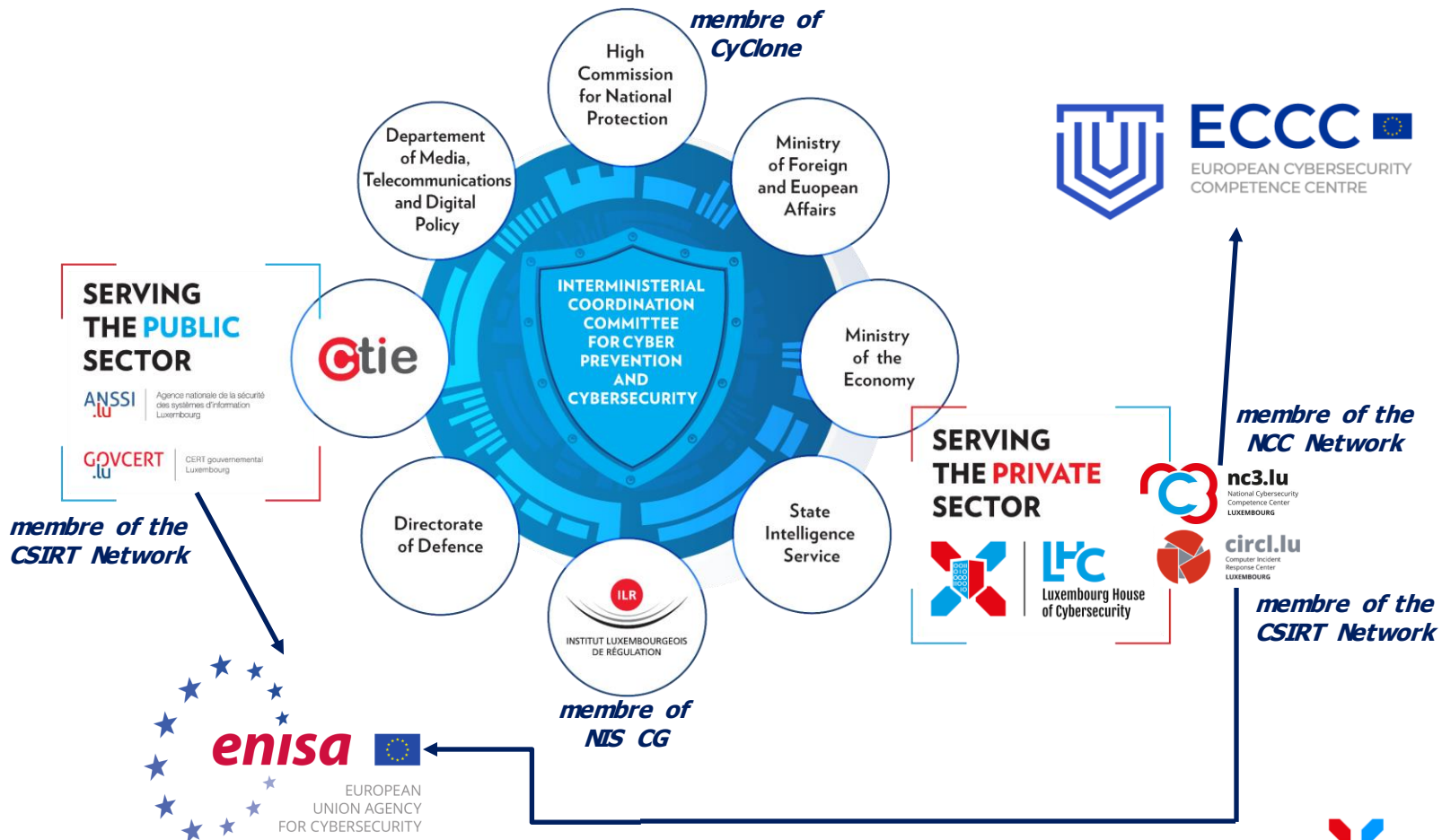
- Objectives
 1. Building trust in the digital world and protection of human rights online
 2. Strengthening the security and resilience of digital infrastructures in Luxembourg
 3. Development of a reliable, sustainable and secure digital economy
- Governance Framework
- Preparedness & Response
- Education and Awareness
- Research & Development



National Cybersecurity Strategy IV



NATIONAL GOVERNANCE



AUTHORITIES & REGULATORS



- **CIP** Critical Infrastructure Protection
(loi du 23 juillet 2016 portant création d'un Haut-Commissariat à la Protection nationale)
- **GDPR** General Data Protection Regulation
(loi du 1er août 2018 portant mise en place du régime général sur la protection des données)
- **NIS(2) (DORA)** Network and Information Security
(loi du 28 mai 2019 portant transposition de la directive NIS)
- **PSDC** Prestataires de Services de Dématérialisation ou de Conservation
(loi du 25 juillet 2015 relative à l'archivage électronique)
- **PSF** Professionnels du Secteur Financier de Support
(loi modifiée du 5 avril 1993 relative au secteur financier)



=> more on cybersecurity.lu



PREPAREDNESS & RESPONSE

PUBLIC-PRIVATE COOPERATION IN ACTION

The screenshot displays the website for cert.lu, the Cyber Emergency Response Community Luxembourg. The header includes the cert.lu logo and navigation links for Home, About, Members, Projects, and Contact. Below the header, a grid of partner logos is presented, each with a corresponding CSIRT category in a box below it:

- restena** (Education & Research)
- CIRCL** Computer Incident Response Center Luxembourg (Economy & Local Government)
- GOVCERT .lu** CERT gouvernemental Luxembourg (NAT / GOV / MIL & CRITICAL INFRA.)
- eSanté LUXEMBOURG** (Health Care)
- itrust consulting** (Malware.LU CERT)
- EXCELLIUM** (CERT XLM)
- clearstream** DEUTSCHE BÖRSE GROUP (DBG-CERT)
- European Commission** (EC DIGIT CSIRC)
- Post LUXEMBOURG** (CSIRT POST CYBERFORCE)
- telindus** (TELINDUS-CSIRT)
- pwc** (PWC CSIRT)
- Hacknowledge** (CSIRT HACKNOWLEDGE)



PREPAREDNESS & RESPONSE

PIU CYBER



THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG

Français | Deutsch | **English**

Info crise

Search



NUCLEAR
EMERGENCY



VIGILNAT



POWER
CUT



CYBER



EXTREME
WEATHER
CONDITIONS



INFLUENZA
AND
PANDEMICS



EBOLA



MASS
CASUALTIES



CBRN



FLOODING



DRINKING
WATER

LU-CIX

DDoS Scrubbing Center



EDUCATION & RESEARCH

Education & Research



Public Sector

40

Institutions are part of the ecosystem

[Access the full list →](#)

National contact point



Access the latest and upcoming International, European and National Legal Frameworks

[Access the full list →](#)

ITY
IRG

SEARCH DASHBOARD LOG IN/REGIS

vs & Events Skills & Jobs Resources & Support About Cont

Private Sector

316

Companies are part of the ecosystem

[Access the full list →](#)

Main point of contact



Created during the last 5 years

30

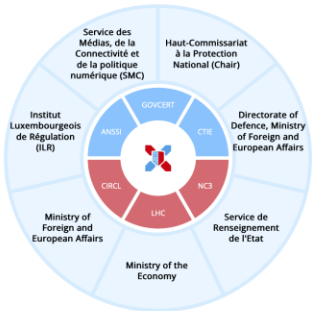


Number of Startups

74

A closer look to the national actors

National Strategy & Governance



Comité Interministériel en matière de cyber-prévention et de cybersécurité (CIC-CPCS)

[Access the full list →](#)

Preparedness & Response



Research & Development



The Ecosystem Dashboard

Interactive dashboard of the Luxembourg Cybersecurity Ecosystem. It presents a complete overview of relevant cybersecurity key figures in the Grand-Duchy.



[Ecosystem Overview](#) Public Sector Private Sector

A closer look to the private sector

Companies Start-ups

Cybersecurity as core business

Companies have Cybersecurity as their core business

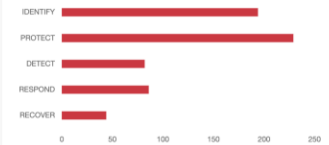
90



ALL COMPANIES COMPANIES WITH CYBERSECURITY AS CORE BUSINESS

[See more →](#)

Diversified solutions offered by the ecosystem



ALL COMPANIES COMPANIES WITH CYBERSECURITY AS CORE BUSINESS

[See more details on the solutions offered →](#)

Ecosystem view

369

Entities are part of the ecosystem



Public Entities

40

Education & Training

Formal Education



[Access the full list →](#)

Initial and Ongoing Training, Re-skilling and Upskilling



[Access the full list →](#)

Awareness Raising Activities



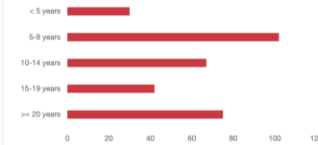
[Access the full list →](#)

Join the ecosystem today!

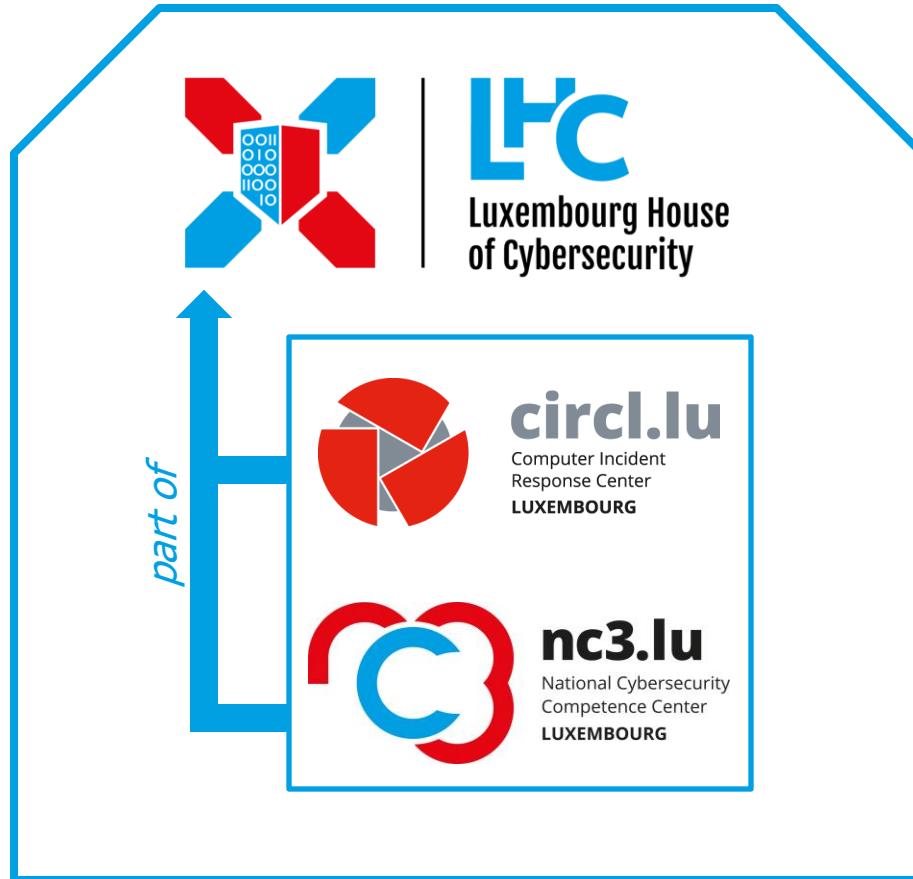
Become an active member of the ecosystem and gain great visibility! Throughout the year, a wide set of actions is organised by the ecosystem for the ecosystem.

[See more information →](#)

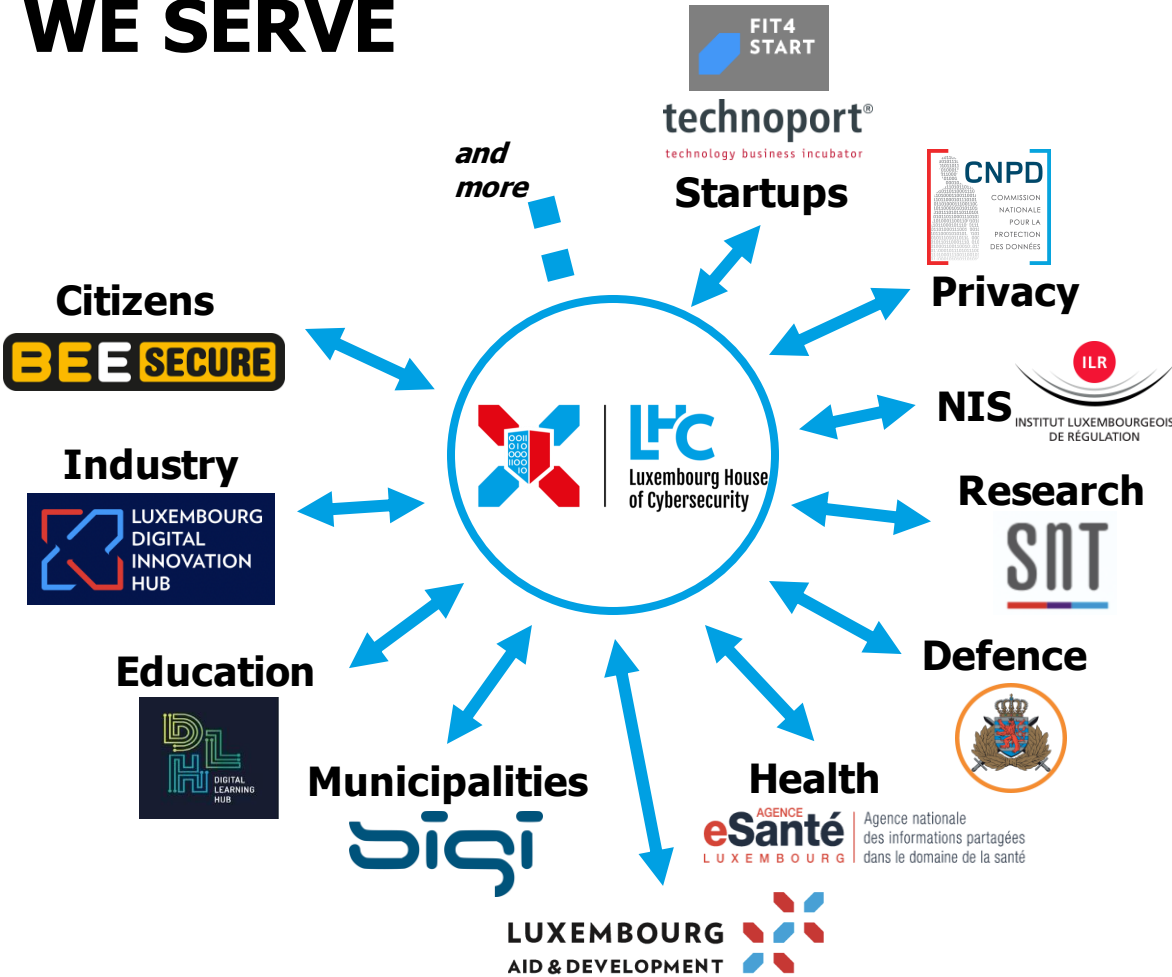
50% of companies have been created in the last 5 years



Protecting the private sector

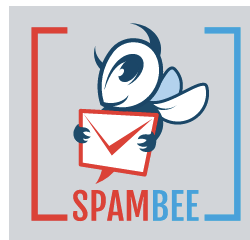


WE SUPPORT WE FOSTER WE SERVE



National Cybersecurity Competence Centre

- Competence and Capabilities Building
- Ecosystem and Industrialisation
- Research, Data and Innovation
- NCC-LU



FIT4CYBERSECURITY - is a self-assessment tool designed for a non-expert audience to estimate in a general way the degree of maturity of its security posture and obtain some basic recommendations.

This tool can be complemented by:

FIT4CONTRACT, to support business owners in verifying if contracts for the procurement of ICT services cover the essential information security aspects.

FIT4PRIVACY, to provide business owners with a good initial overview of their maturity in the field of privacy and data protection (as required by the GDPR).



TOP - aims to support its users with evidence-based information on cybersecurity emerging threats, in order to facilitate their decision-making processes regarding the prevention strategies to be undertaken.



TRUST BOX - is the ideal toolset to raise cybersecurity awareness and empower all users with better cyber hygiene.



TESTING PLATFORM - holds the tools and services that will help organisations to perform basic tests on their most commonly exposed infrastructures, starting with email and web servers.



MONARC - is a tool and a method allowing an optimised, precise and repeatable risk assessment.

Computer Incident Response Center Luxembourg



- CSIRT (Incident Coordination and Incident Handling)
- Cyber Threat Intel and support tools
- CSIRT NIS



The screenshot displays a list of CIRCL services. It includes sections for public services (TYPOSQUATTING, LOOKYLOO, PANDORA, URL ABUSE) and private services (MISP, AIL). Each service is accompanied by its logo and a brief description of its function.

CIRCL TYPOSQUATTING
Typosquatting Finder

TYPOSQUATTING FINDER is a free and public service to quickly find typosquatted domains to assess if an adversary uses any existing fake domains. You can enter a domain to discover potentially typo-squatted domains. An advanced option allows you to select the algorithms used.

CIRCL LOOKYLOO

LOOKYLOO is a web interface that captures a webpage and then displays a tree of the domains that call each other. Lookyloo can be used to test unknown or potential malicious links safely.

CIRCL PANDORA

PANDORA is an analysis framework to discover if a file is suspicious and conveniently show the results. You can safely use this free online service to review files or documents received by a third party.

CIRCL URL ABUSE

URL ABUSE is a public CIRCL service to review the security of an URL (Internet link). Users regularly encounter links while browsing the Internet or receiving emails. When there are some doubts regarding an URL (e.g. potential phishing attacks or malicious links), users can submit an URL for review, and a take-down process of the fraudulent content is initiated.

More public services are listed on <https://www.circl.lu/services/>

CIRCL ALSO OFFERS ACCESS TO PRIVATE SERVICES OR CLOSED COMMUNITIES:

CIRCL MISP
Threat Sharing

MISP - Open Source Threat Intelligence and Sharing Platform (formerly known as Malware Information Sharing Platform) access is available on request. MISP gives an overview of the current trends of attacks and threat indicators, it is a sharing platform that enables teams to collaborate and provides API access to ingest the information for detection and remediation into the security tools by the organisations.

CIRCL AIL
Analysis of Information Leaks

AIL LEAK DETECTION AIL Project is an open source framework to collect, crawl, dig and analyse unstructured data, like information leaks publicly available on the Internet or Darknet. Organisations in Luxembourg can benefit from the service by being notified based on contextual keyword lists.



Digital Security Risk Management for Economic and Social Prosperity

OECD Recommendation and Companion Document



2015

“Digital security risk should be treated like an economic rather than technical issue, and should be part of the organization’s overall risk management and decision-making”

Cybersecurity for Europe

- The 3 strategies shaping EU's cyber future
- “Team cyber” for Europe
- Horizon & Digital Europe Programmes
- ECCC, the Network & the Community
a bottom-up approach to achieve cybersecurity excellence for Europe

Strategy for Shaping Europe's Digital Future



European Security Union Strategy



EU Cybersecurity Strategy

1. Resilience, technological sovereignty and leadership
 - NIS2, **ECCC**, cybersecurity shield (SOC), DIHs
2. Building operational capacity to prevent, deter and respond
 - **ENISA**, CERT-EU, JCU, Defense Fund
3. Advancing a global and open cyberspace through increased cooperation
 - Cyber Diplomacy, UN AHC, EUCybernet

“Team cyber” for Europe



- NIS Coordination Group
- CSIRT Network
- CyCLONE (Cyber Crisis Liaison Network)
- The Network (NCCs)
- The Community (Research, Academia, Industry & Civil Society)

ECDC missions

Cybersecurity is a common responsibility and effort, only together can we achieve to cybersecure the EU

- Strengthen EU's **leadership** and strategic **autonomy** on cybersecurity by developing the EU's capacities and capabilities of the Digital Single Market;
- Support and foster **research, innovation** and **technological** developments, for the resilience of systems, including critical infrastructure as well as commonly used hardware and software;
- Encourage and coordinate training activities, to ensure that everyone in Europe has access to the university and **life-long-learning** courses, as well as to motivate young people to go for a **cybersecurity career** and support efforts that address the gender gap; and
- Increase the global **competitiveness** of the EU's cybersecurity industry, ensure high cybersecurity standards throughout the EU and turn cybersecurity into a competitive advantage.

Exam

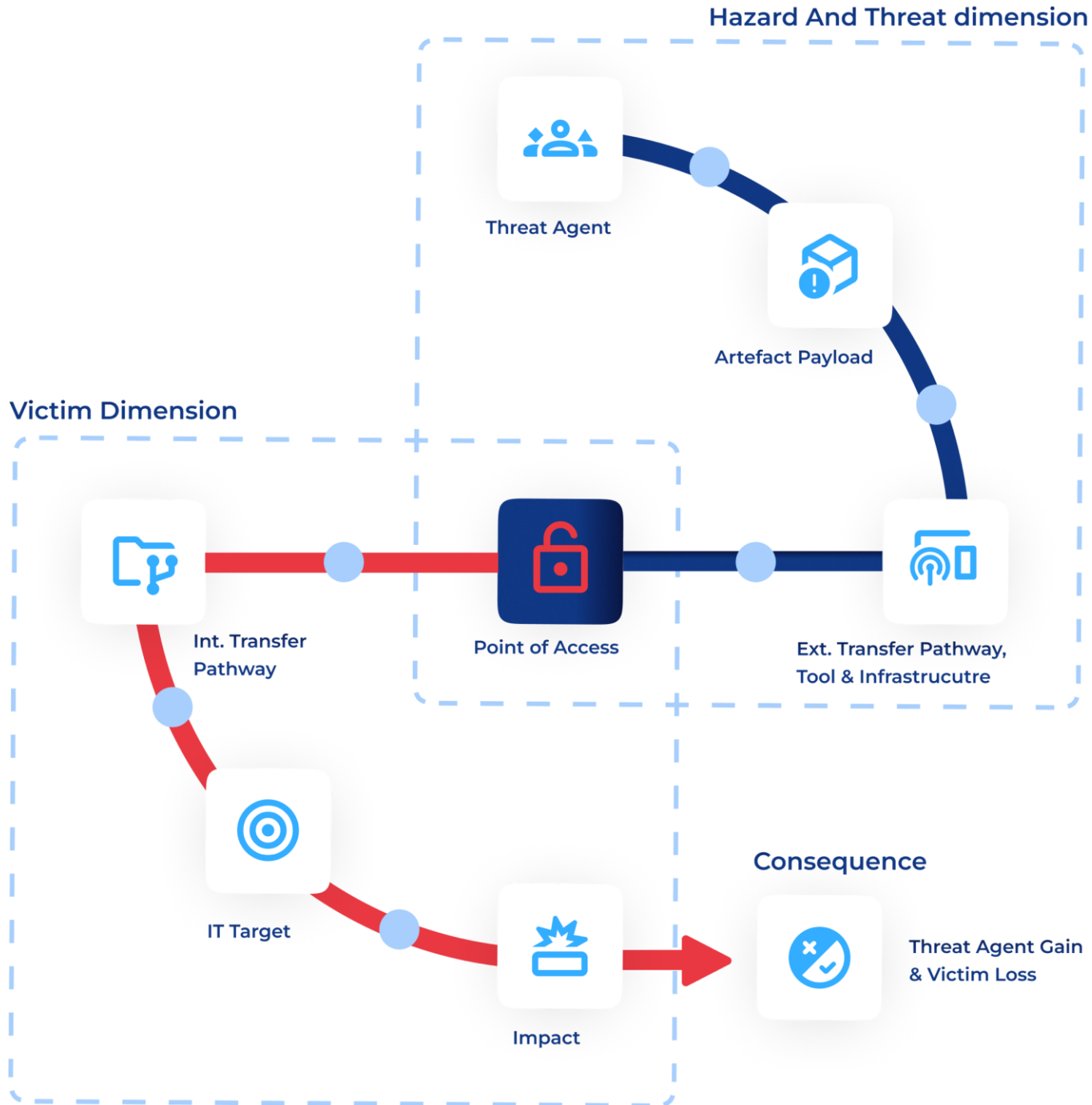
Homework / Exercice





Threat Observatory

By NC3 – National Cybersecurity Competence
Centre

45



2022 IV – Quarterly Bulletin

 nc3.lu <small>National Cybersecurity Competence Center LUXEMBOURG</small>		BULLETIN Qtr4		 L3C <small>Luxembourg House of Cybersecurity</small>	
THREAT ACTOR					
	<i>Qtr3</i>		<i>Qtr4</i>		<i>Trend</i>
	#	%	#	%	
APT38	0	0,00%	1	0,07%	↑
FIN7	0	0,00%	2	0,14%	↑
Gamaredon Group	5	0,34%	4	0,28%	↔
Kimsuky	12	0,82%	2	0,14%	↓
Lazarus Group	11	0,75%	1	0,07%	↓
Mustang Panda	0	0,00%	1	0,07%	↑
OPERA1ER	0	0,00%	2	0,14%	↑
Sandworm Team	0	0,00%	1	0,07%	↑
Silent Librarian	5	0,34%	1	0,07%	↓
Turla	1	0,07%	2	0,14%	↑
Number of attributed events	48	3,28%	17	1,18%	▼
Number of unattributed events	1417	96,72%	1427	98,82%	=
Attribution Rate	3,3%		1,2%		▼

<https://nc3.lu/pages/b2022/q4/b2022q4.html>

Exercise

- Choose and understand the threat actor
- Identify and select relevant counter-measures (ISO 27002:2022 controls)
- Define implementation
 - In-house: resources (processes, budget, HR, tools, services, etc.)
 - Out-sourced: partners from the ecosystem
- Describe and argument your choices/decisions
- MAX 3-4 pages

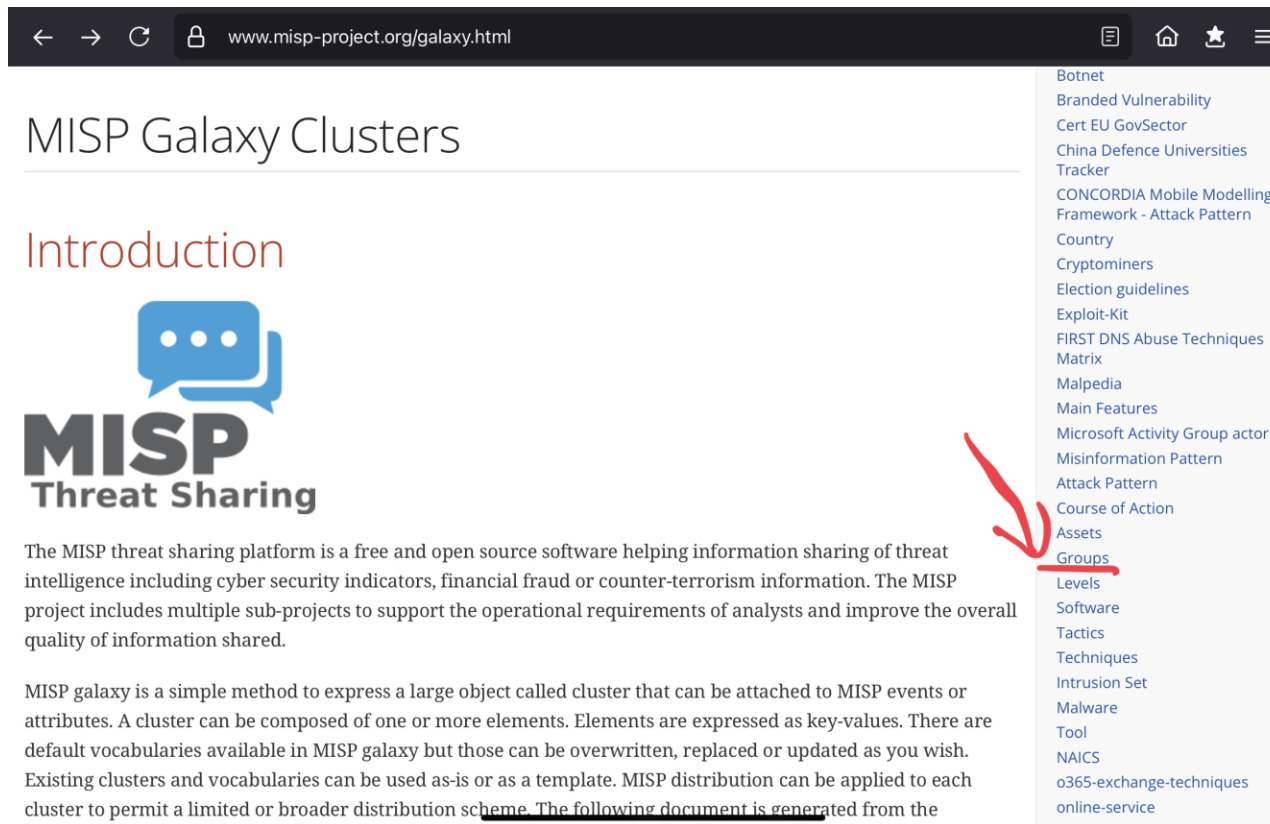


Toolbox

- NC3 Threat Observatory
- MISP *Galaxies*
- ISO 27002:2022
- Cybersecurity Luxembourg Ecosystem
- all other resources you see relevant




MISP (galaxies)



← → ↻ 🔒 www.misp-project.org/galaxy.html

MISP Galaxy Clusters

Introduction



The MISP threat sharing platform is a free and open source software helping information sharing of threat intelligence including cyber security indicators, financial fraud or counter-terrorism information. The MISP project includes multiple sub-projects to support the operational requirements of analysts and improve the overall quality of information shared.

MISP galaxy is a simple method to express a large object called cluster that can be attached to MISP events or attributes. A cluster can be composed of one or more elements. Elements are expressed as key-values. There are default vocabularies available in MISP galaxy but those can be overwritten, replaced or updated as you wish. Existing clusters and vocabularies can be used as-is or as a template. MISP distribution can be applied to each cluster to permit a limited or broader distribution scheme. The following document is generated from the

- Botnet
- Branded Vulnerability
- Cert EU GovSector
- China Defence Universities Tracker
- CONCORDIA Mobile Modelling Framework - Attack Pattern
- Country
- Cryptominers
- Election guidelines
- Exploit-Kit
- FIRST DNS Abuse Techniques Matrix
- Malpedia
- Main Features
- Microsoft Activity Group actor
- Misinformation Pattern
- Attack Pattern
- Course of Action
- Assets
- Groups**
- Levels
- Software
- Tactics
- Techniques
- Intrusion Set
- Malware
- Tool
- NAICS
- o365-exchange-techniques
- online-service

<https://www.misp-project.org/galaxy.html>



ISO 27002:2022

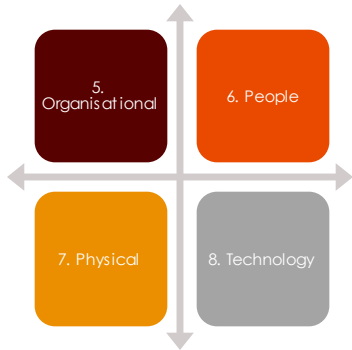
Information security, cybersecurity and privacy protection – Information security controls

Overview

Themes

The categorisation of controls given in Clauses 5 to 8 are referred to as **themes**:

- a) **people**, if they concern individual persons;
- b) **physical**, if they concern physical objects;
- c) **technological**, if they concern technology;
- d) otherwise they are categorised as **organisational**.



Overview

Attributes (1)

Each control has been associated with **five attributes** with corresponding attribute values, as follows:

- 1) **Control type** is an attribute to view controls from the perspective of **when and how** the control modifies the risk with regard to the occurrence of an information security incident.
- 2) **Information security properties** is an attribute to view controls from the perspective of which **characteristic of information** the control will contribute to preserving.
- 3) **Cybersecurity concepts** (ref. ISO/IEC TS 27110)
- 4) **Operational capabilities** is an attribute to view controls from the **practitioner's perspective** of information security capabilities.
- 5) **Security domains**

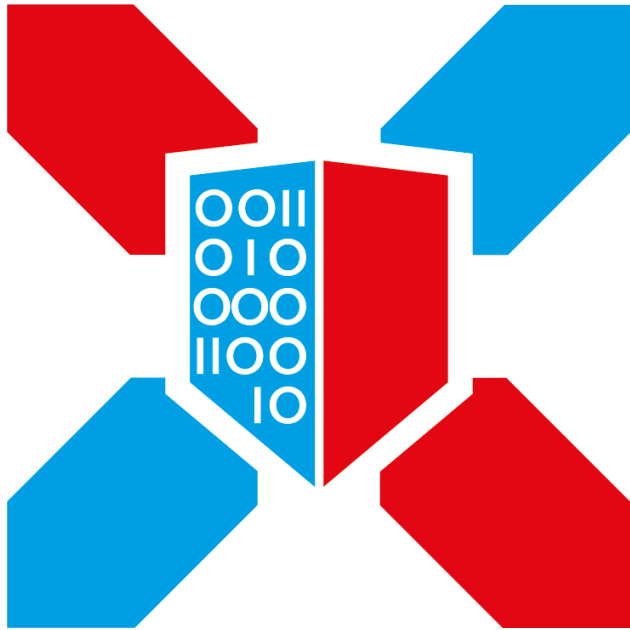
Overview

Attributes (2)

Cybersecurity concepts
attribute values consist of:



- **Identify,**
- **Protect,**
- **Detect,**
- **Respond, and**
- **Recover.**



CYBERSECURITY LUXEMBOURG

The Luxembourg Cybersecurity Ecosystem



SEARCH

DASHBOARD

LOG IN/REGISTER

IMMEDIATE SUPPORT

56

- The Ecosystem
- News & Events
- Skills & Jobs
- Resources & Support
- About
- Contact

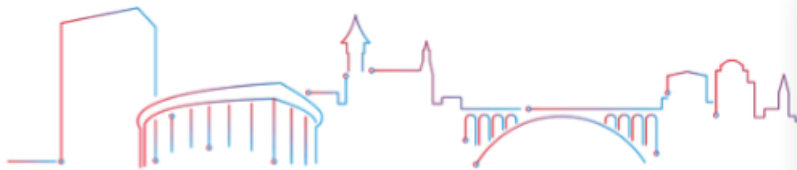
The national cybersecurity portal, for everyone

All in one place, explore & be a part of this community-driven platform whether you are a seasoned pro or just starting out.

The Ecosystem

How can we help?

<https://cybersecurity.lu>



IM (2 & exam) - PolSec - MISSM - uni.lu

Latest Alerts [Close]

< Spear phishing and voice call scams targeting corporate executives and their accounting... >

[See all alerts](#) →

The Ecosystem Dashboard

Welcome to the interactive dashboard of the Luxembourg Cybersecurity Ecosystem. It presents a complete overview of all relevant cybersecurity key figures in the Grand-Duchy.



Ecosystem Overview Public Sector Private Sector

Private Sector

316

Companies are part of
the ecosystem

[Access the full list →](#)

Main point of contact



Created during the last 5
years

28



Number of Startups

74

Companies Start-ups

Cybersecurity as core business

Companies have Cybersecurity as their core business

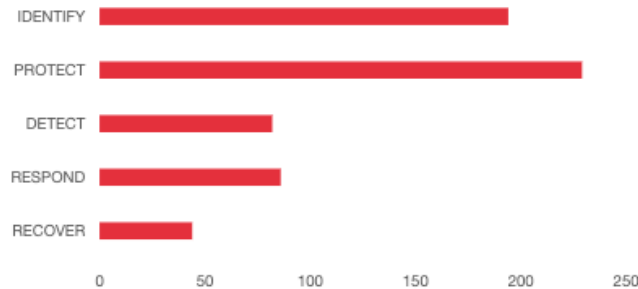
90



● ALL COMPANIES ● COMPANIES WITH CYBERSECURITY AS CORE BUSINESS

[See more →](#)

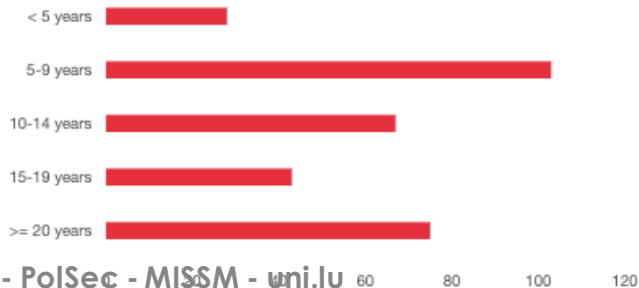
Diversified solutions offered by the ecosystem



● ALL COMPANIES ● COMPANIES WITH CYBERSECURITY AS CORE BUSINESS

[See more details on the solutions offered →](#)

50% of companies have been created in the last 5 years



Join the ecosystem today!

Become an active member of the ecosystem and gain great visibility! Throughout the year, a wide set of actions is organised by the ecosystem for the ecosystem.

[See more information →](#)

Filter by [Clear all](#)

CORE BUSINESS

Cybersecurity

COMPANY TYPE

Start-up


PC Doctors

CLASSIFICATION

i


- > IDENTIFY
- > PROTECT
- > DETECT
- > RESPOND
- > RECOVER

Entities found 316




3C PAYMENT LUXEMBOURG S.A.

[See entity profile →](#)




AbAKUS it-solutions

[See entity profile →](#)




Acarda Services S.à r.l.

[See entity profile →](#)




Accenture Security

[See entity profile →](#)



ADNEOM Luxembourg

[See entity profile →](#)



AdronH S.à r.l-S

[See entity profile →](#)



Abil

Advisory, Brokerage & Insurance Leaders



Aedes IT

Thank you for
your attention

CISO community space



Luxchat
● ● ●

<https://lhc.lu/service/luxchat>