

# Introduction to MONARC

## Optimised Risk Analysis Method

Security Made In Lëtzebuerg / CASES

Cyberworld Awareness and Security Enhancements Services

September 29, 2021



# Security Made In Lëtzebuerg

Our history:

- 2003: Cyberworld Awareness and Security Enhancement Services (**CASES**);
- 2007: Computer Incident Response Center Luxembourg (**CIRCL**);
- 2010: Security Made In Lëtzebuerg is a *G/E* (Groupement d'Intérêt Économique);
- 2017: Cyber security Competence Center (**C3**).

CASES is an initiative of the Ministry of Economy after the worm *I love you* decimated more than 3 millions computers in less than a week.



# CASES

## Mission

Foster information security by supporting Luxembourg administrations and SMEs.

## Services

- **Awareness:** publications of articles and videos;
- **Trainings:** introduction to cyber security for different audiences;
- **Software:** MONARC, MOSP, Fit4Cybersecurity, TACOS, etc.

## Cooperations

ANSSI-LU (National Cybersecurity Agency of Luxembourg), CCB (Centre for Cyber security Belgium), KonzeptAcht GmbH and others.



# Content at glance

- 1 What is MONARC?
- 2 The method
- 3 The tool

# Summary

## 1 What is MONARC?

- An open source software
- A community
- A method

## 2 The method

## 3 The tool



# An open source software

MONARC is the tool you need for an optimised, precise and repeatable risk assessment.

- Web application (SaaS, self-hosted, virtual machine, etc.);
- **source code**<sup>1</sup>: GNU Affero General Public License version 3;
- **data**: CC0 1.0 Universal - Public Domain Dedication.

MONARC is easy to use. No crazy learning curve.

Used and recognized by experts from different fields (not only information security).

And for many users, it started with a spreadsheet!

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<sup>1</sup><https://github.com/monarc-project>



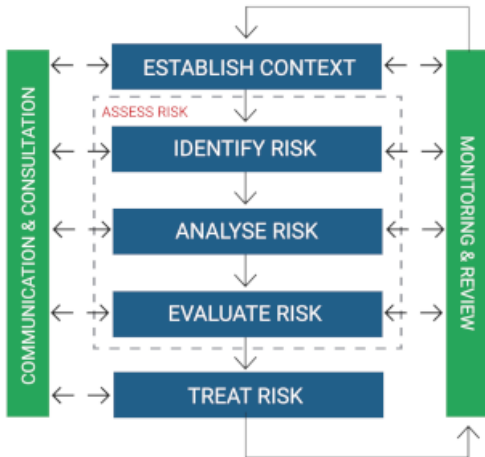
# A community

- more than 230 organizations:  
`https://my.monarc.lu`;
- sharing MONARC objects (threats, assets, recommendations, etc.):  
`https://objects.monarc.lu`;
- a global dashboard with trends about threats and vulnerabilities:  
`https://dashboard.monarc.lu`.



# A method

Based on ISO/IEC 27005:2011, but optimized



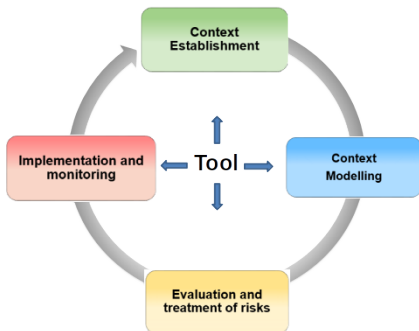


# Summary

- 1 What is MONARC?
- 2 The method
  - Management of risk
  - An optimized method
- 3 The tool



# A Structured, Iterative and Qualitative method

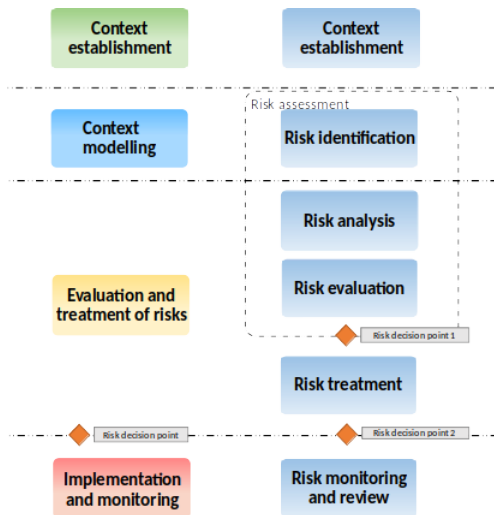


- Structured: 1, 2, ..., n.
- Iterative: **Plan, Do, Check, Act**
- Qualitative: **Values / Consequence**
  - Impact/Consequence, Threat, Vulnerability;
  - reputation, image;
  - operation;
  - legal;
  - financial;
  - person (to the).

Possibility to define custom scales for operational risks.

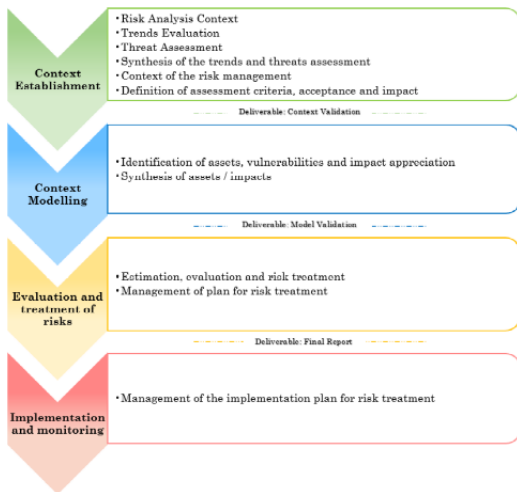
# Automated and simplified management

Method based on ISO/IEC 27005



# Automated and simplified management

Sub-stages provided by the method are also in line with ISO/IEC 27005



# ISO/IEC 27005:2011

## Information risks

### Formula

$$R = I \times T \times V$$

- impact on **C**onfidentiality **I**ntegrity **A**vailability;
- on secondary assets.



# ISO/IEC 27005:2011

## Operational risks

### Formula

$$R = I \times P$$

- impact by default on ROLFP (possibility to define custom scales);
- on primary assets.



# Optimizations

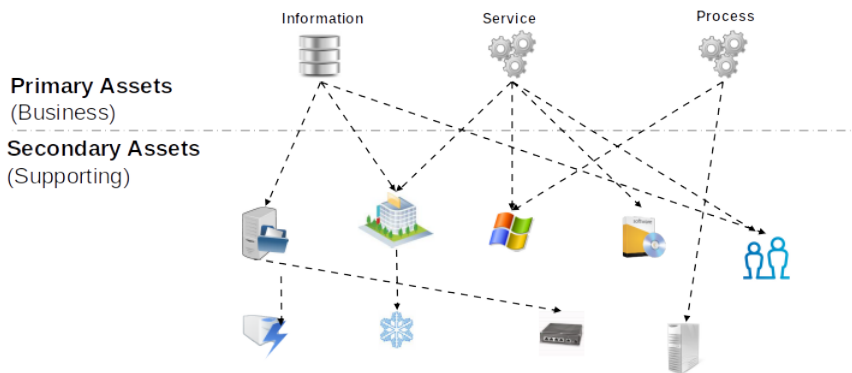
MONARC is an optimized method:

- inheritance on objects;
- scope of objects;
- inheritance on impacts;
- deliverables.



# Inheritance on objects

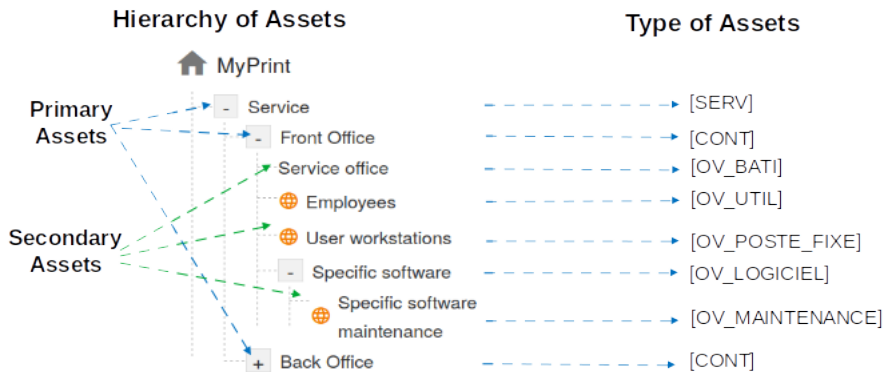
## Modelling





# Inheritance

## Formalisation of the modelling



# Inheritance

## Formalisation of an asset

### Example with OV\_BATI

Threat	Vulnerability
Theft or destruction of media, documents or equipment	Flaws in the physical access boundaries
Theft or destruction of media, documents or equipment	The principle of least privilege is not applied
Theft or destruction of media, documents or equipment	Authorisation management is flawed
Abuse of rights	No supervision of third-party access (supplier, cleaner, etc.)
Environmental disaster (fire, flood, dust, dirt, etc.)	Premises are not secure or could be compromised by external elements

# Scope of objects

## Global or local assets

### “Local”

Mon analyse

- Base de données N°1
  - Logiciel
  - Backup NAS
  - Salle informatique.
- Base de données N°2
  - Logiciel
  - Backup NAS
  - Salle informatique.

30 risks

### “Global” 🌐

Mon analyse

- Base de données N°1
  - Logiciel
  - 🌐 Backup NAS
  - 🌐 Salle informatique
- Base de données N°2
  - Logiciel
  - 🌐 Backup NAS
  - 🌐 Salle informatique

21 risks

Base de données N°1



Base de données N°2



Base de données N°1



# Inheritance on impacts

Home > MyPrint

Risk analysis

Expand all / Wrap all

Search an asset...

MyPrint

- Front Office
- Service office
- Employees
- User workstations
- Specific software
- Printing department
- Computer graphics department
- GDPR legal obligations

Assets library

Search an asset...

- Fundamentals
  - Primary Assets
  - Model Structure
  - Backup
  - Buildings & Premises
  - Physical Goods
  - Software
  - Equipment
  - Staff
  - Organization
  - Servers
  - Network
  - GDPR
  - EBIOS

User workstations  
Group of user workstations

Confidentiality : 2 (inherited) Integrity : 3 (inherited) Availability : 4 (inherited)

8 information risks

Risk threshold (on max CIA) ● ○ ○ ○ Keywords

Kind of treatment

Sort MAX risk Sort direction Descending

Asset	Impact			Threat		Vulnerability			Current risk			Treatment	Residual risk
	C	I	A	Label	Prob.	Label	Existing controls	Qualif.	C	I	A		
User workstations	2	3	4	Forging of rights	3	Authorisation management is flawed	No access control	5	30	45	60	Reduction	12
User workstations	2	3	4	Malware infection	3	No detection system of malicious programs	The antivirus is updated via an internal server. The user cannot disable it.	1	6	9	12	Not treated	12
User workstations	2	3	4	Abuse of rights	2	No procedures for system install and configuration	The workstations are formatted from a standard image.	1	4	6	8	Not treated	8
User workstations	2	3	4	Retrieval of recycled or discarded media	2	Presence of residual data unknown to the user of reallocated or discarded equipment	All discarded workstations are "zeroed" by the IT department.	1	4			Not treated	4
User workstations	2	3	4	Forging of rights	-	User authentication is not ensured		-	-	-	-	Not treated	-
User workstations	2	3	4	Forging of rights	-	The user workstation is not monitored		-	-	-	-	Not treated	-
User workstations	2	3	4	Malware infection	-	Programs can be downloaded and installed without monitoring		-	-	-	-	Not treated	-
User workstations	2	3	4	Malware infection	-	Update management (patches) is flawed		-	-	-	-	Not treated	-

+ Create a specific risk

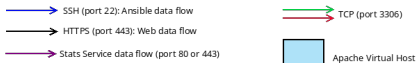
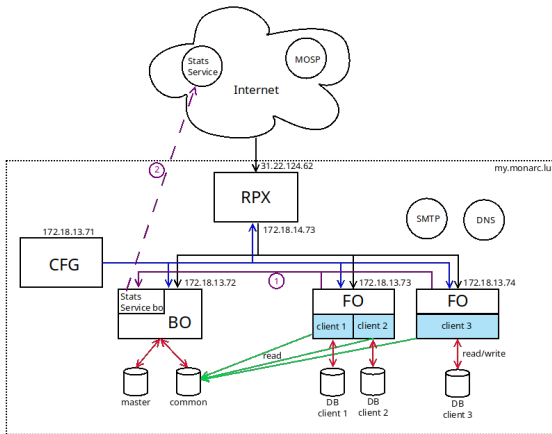
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# Deliverables

Shareable and customised templates of deliverables.

# Summary

- 1 What is MONARC?
- 2 The method
- 3 The tool
  - Architecture
  - Workshop
  - Modules
  - Roadmap



MariaDB: MONARC (client and common) databases

①

Stats collection (local)

②

Stats sharing

MOSP: <https://objects.monarc.lu>

Stats Service: <https://dashboard.monarc.lu>

Stats Service bo: internal Stats Service instance, for example dashboard.my.monarc.lu

# Le'ts work a little!

- **training instance:** `https://formation.monarc.lu`
- **login:** `user_X@monarc.lu`, where  $01 \leq X \leq 30$ ;
- **password:** `Password1234!`

or use the virtual machine: `https://vm.monarc.lu`

Compatible Web browsers: Firefox, Chrome and Safari.





# Dashboard

- provide different visualizations of the current analysis state;
- visualizations are exportable (.png, .csv, .pptx).

# Statement of Applicability

Statement of Applicability (SOA) and compliance level for a referential security.

# Record of processing activities

Register of the information treatment for processing activities.

# Latest notable developments

- definition of custom scales for operational risks (MONARC 2.11.0);
- dashboard for the CEO with data gathered from different MONARC instances (MONARC 2.10.1);
- records of processing activities for the GDPR and set of recommendations (MONARC 2.9.0);
- connection with MOSP (MONARC 2.8.2);
- statement of applicability (MONARC 2.7.0).



# Future developments

- enhancements to the global dashboard towards a security weather forecast<sup>2</sup>;
- enhancements to the sharing of MONARC objects with MOSP<sup>3</sup>;
- link between GDPR module and some objects in MONARC;
- new front-end.

Idea ? → Feature request

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<sup>2</sup><https://dashboard.monarc.lu>

<sup>3</sup><https://objects.monarc.lu>



# Services related to MONARC

- help at deploying;
- help at using;
- trainings;
- developments, feature requests.

# End of the presentation

- Thank you for listening.
- Contact: [info@cases.lu](mailto:info@cases.lu)
- <https://github.com/CASES-LU>
- <https://github.com/monarc-project>
- <https://www.monarc.lu>