

Mercator Mapping the information system



What is Mercator?

Mercator is a Web application used to manage the mapping of an information system as described in the ANSSI Guide to Information System Mapping.

What is mapping?

Mapping is a way of representing an organisation's information system and its connections with the outside world. The term 'cartography' refers to a schematic representation of a set of information.

Cartography <-> Inventory

Who is Mercator?

Mercator was a cartographer. He was the author of the Mercator projection, which is a conformal projection, i.e. it preserves the angles of the Earth's surface. (very useful for sailing in the 16th century).



Methodology

Implementing IS mapping is a strategic project.

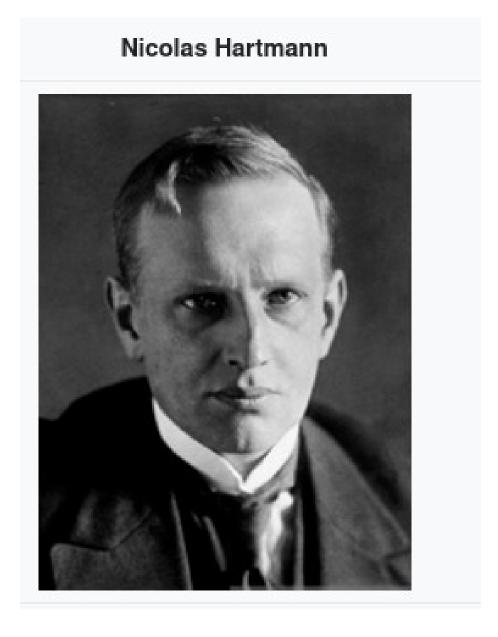
Stages of implementation:

- Management support
- Define objectives and requirements
- Identify stakeholders
- Gather information on IS assets
- Model the IS architecture
- Analyse and validate the mapping
- Communicating and using the map

Ontology

The aim is to reference and classify detailed knowledge about each component of an information system.

The elements inventoried are related on the basis of organisational, functional, technical and data flow dependencies.



Philosophe allemand, 1833 – 1905

Existence and essence

Epistemology

The way in which knowledge of the system is acquired and validated.

It explores the assumptions and approaches used to understand and document how the IS works, ensuring that the information collected is reliable and relevant.

Capability / Authority

Capability: This is the ability of objects or systems to perform certain actions or carry out specific tasks. In other words, it is what an object (an application, a server, a service) can do within the information system.

Authority: This term refers to the authorisation or delegation granted by a responsible person (such as a head of department) to allow access to or use of a resource or system.

Configuration ≠ **Objective**

- •The current configuration often reflects a static state that may no longer match your objective.
- •Systems evolve quickly, with additions, modifications, or removals that are not always correctly implemented.
- ·Basing a mapping on this state can lead to inconsistencies.

You should not start building all your cartography based on the actual configuration.

Why map?

Mapping is an essential tool for managing an information system. Mapping provides information on all the components of the IS and makes it easier to understand by presenting it from different angles.

Four digital security challenges:

Controlling the information system: mapping provides a common, shared vision of the information system within the organisation.

Protecting the information system: mapping makes it possible to identify the most critical and most exposed systems, to anticipate possible attack paths on these systems and to put in place appropriate measures to protect them.

Information system defence: mapping makes it possible to react more effectively in the event of an incident or digital attack, to qualificate the impacts and to predict the consequences of the defensive actions taken.

Information system resilience: mapping helps to identify the organisation's key activities afin defin a business continuity plan and is an essential tool for crisis management, whether digital or not.

Composition of a map

1. Business view

- The ecosystem view presents the different entities or systems with which the IS interacts to fulfil its function.
 - The business view of the information system represents the IS through its main processes and information.
- The RGPD view presents the processing operations with their processes, applications, information and security measures.

2. Application view

- The application view describes the software components of the information system, the services they offer and the flux of data between them.
- The administration view lists the perimeters and privilege levels of users and administrators.

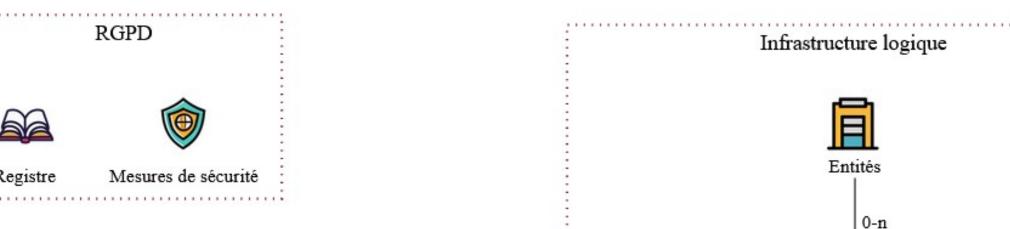
3. Infrastructure view

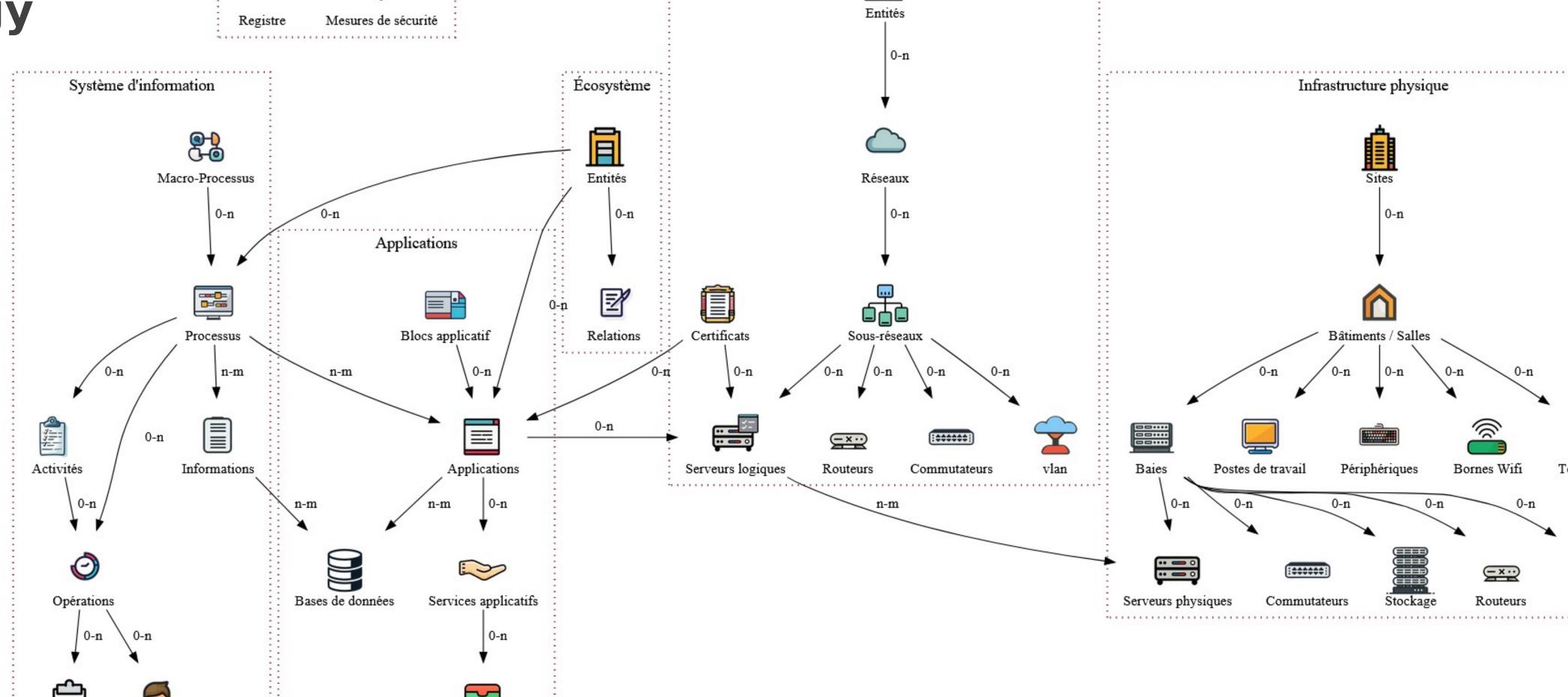
- The logical infrastructure view illustrates the logical partitioning of networks, in particular through the definition of IP address ranges, VLANs and filtering and routing functions;
- The physical infrastructure view describes the physical equipment that makes up the information system or is used by it.

Tâches

Acteurs

Topology





Levels of granularity

Each stage has its own level of granularity.

Level 1 minimum granularity:

Initial elements essential to digital security operations

Level 2 intermediate granularity:

Digital security-oriented mapping. Vital information systems (SIIV) must have mapping at this minimum level of maturity.

Level 3 fine granularity:

Exhaustive and detailed mapping, incorporating digital security requirements.

Objets/Attributs	Démarche de cartographi numé	Démarche globale de cartographie		
concernés	Maturité de niveau 1	Maturité de niveau 2	Maturité de niveau 3	
	Vue de l'	écosystème		
Granularité 1	•	•	•	
Granularité 2			•	
	Vue métie	r du système		
Granularité 1		•	•	
Granularité 2		•	•	
Granularité 3			•	
	Vue des	applications		
Granularité 1		•		
Granularité 2			•	
	Vue de l'a	dministration		
Granularité 1		•	•	
	Vue des infras	tructures logiques		
Granularité 1	•	•	•	
Granularité 2		•	•	
	Vue des infrast	ructures physiques		
Granularité 1		•	•	
Granularité 2			•	

Calculation of maturity level

Presence of information:

- no description
- no person in charge
- no type ...

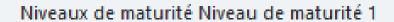
Links between elements:

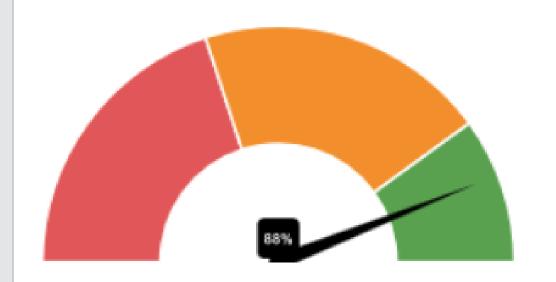
- entity without relationships
- process without operations
- application that does not support any process
- server without applications

Calculation:

compliant elements / total elements

% represents the effort required to comply



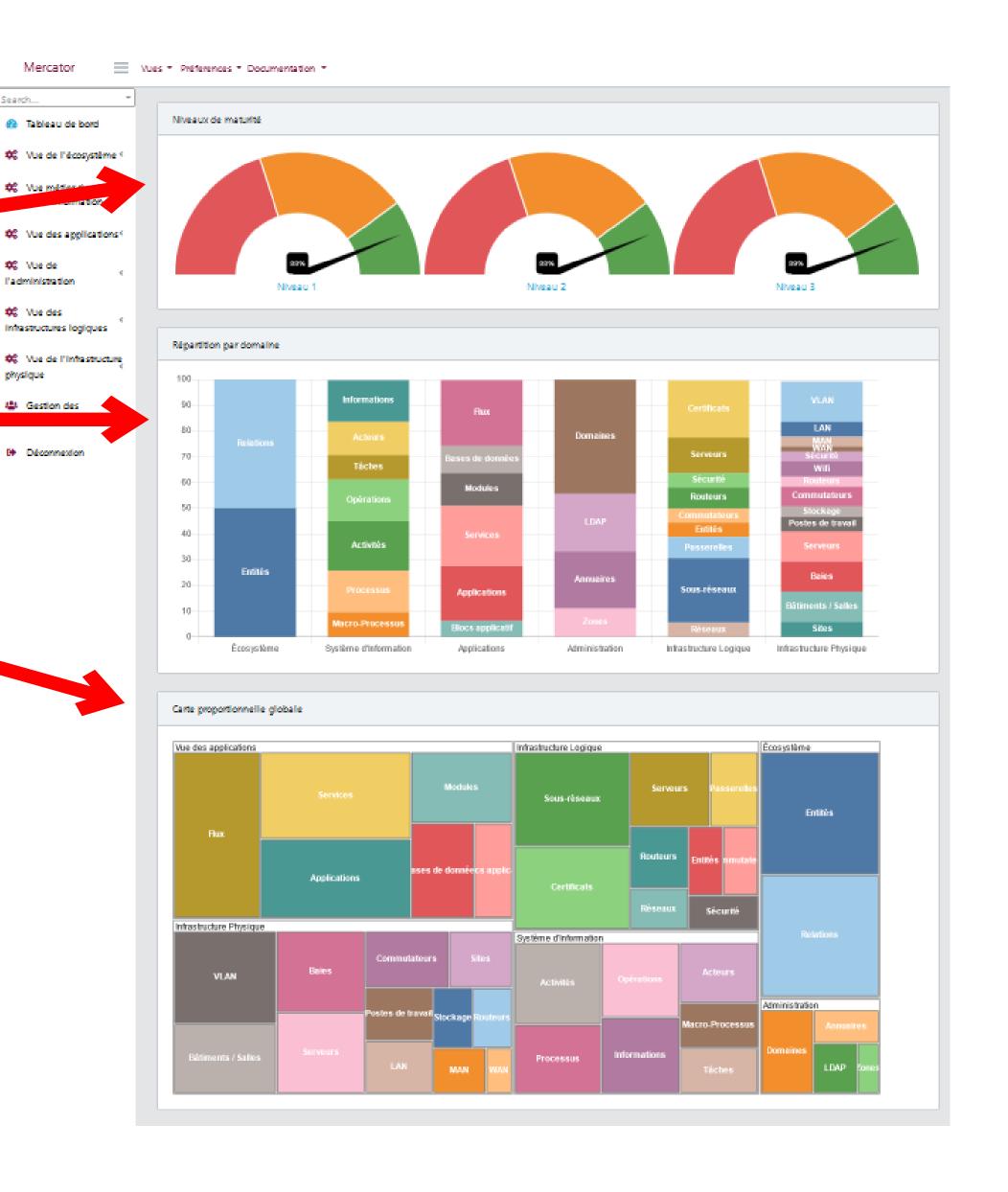


Granularité minimale de niveau 1 : informations indispensables.

Écosystème	#	Mature	79 %
Entités	12	12	100 %
Relations	12	7	58 %
Système d'Information	#	Mature	87 %
Processus	5	5	100%
Opérations	5	4	80%
Informations	5	4	80%
Applications	#	Mature	74%
Applications	10	5	50%
Bases de données	5	5	100%
Flux	12	10	83%

Main screen

- Level of maturity
- Breakdown by domain
- Global proportional map

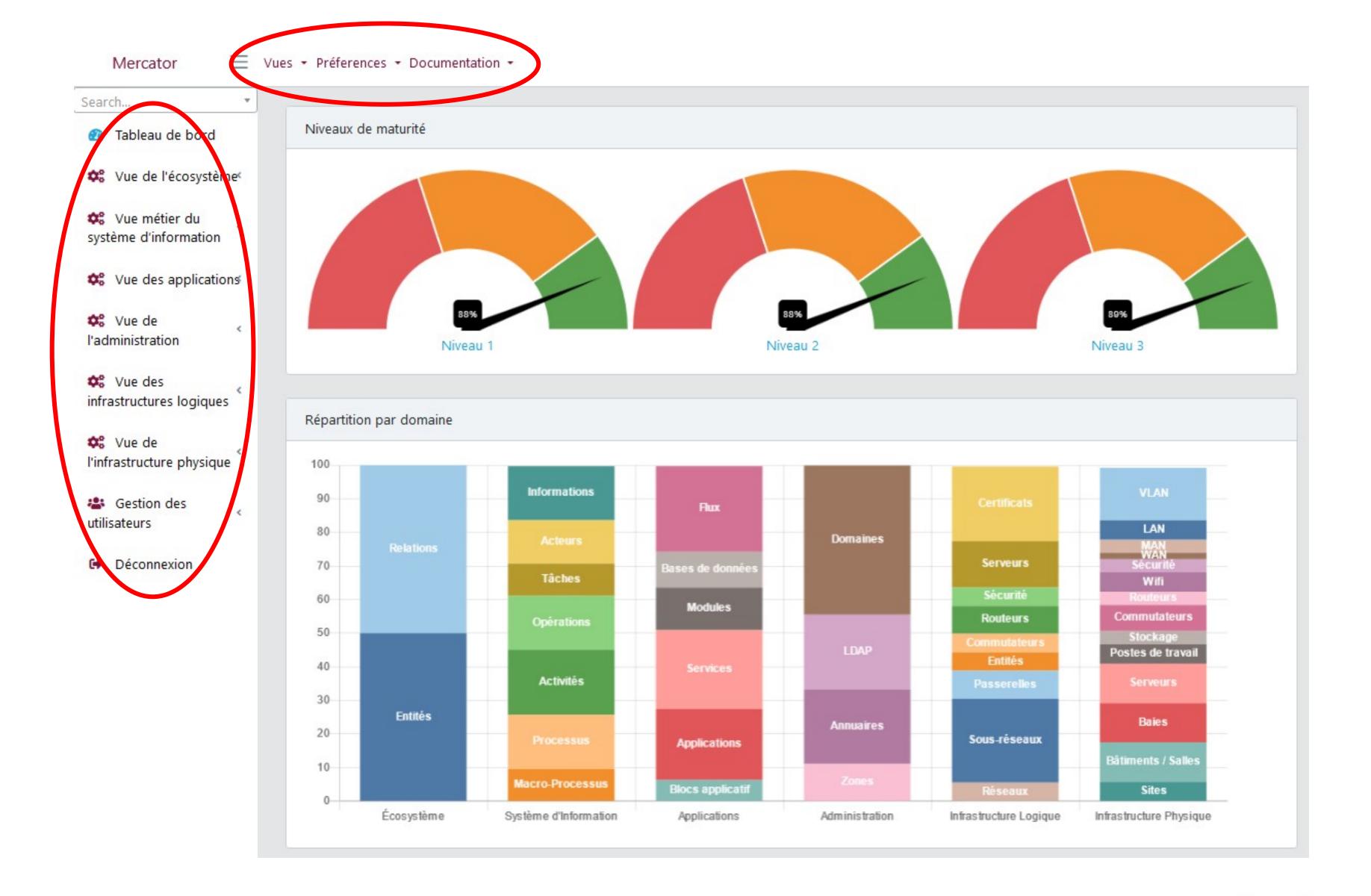


Top panel

- Views
- Preferences
- Documentation /Reports

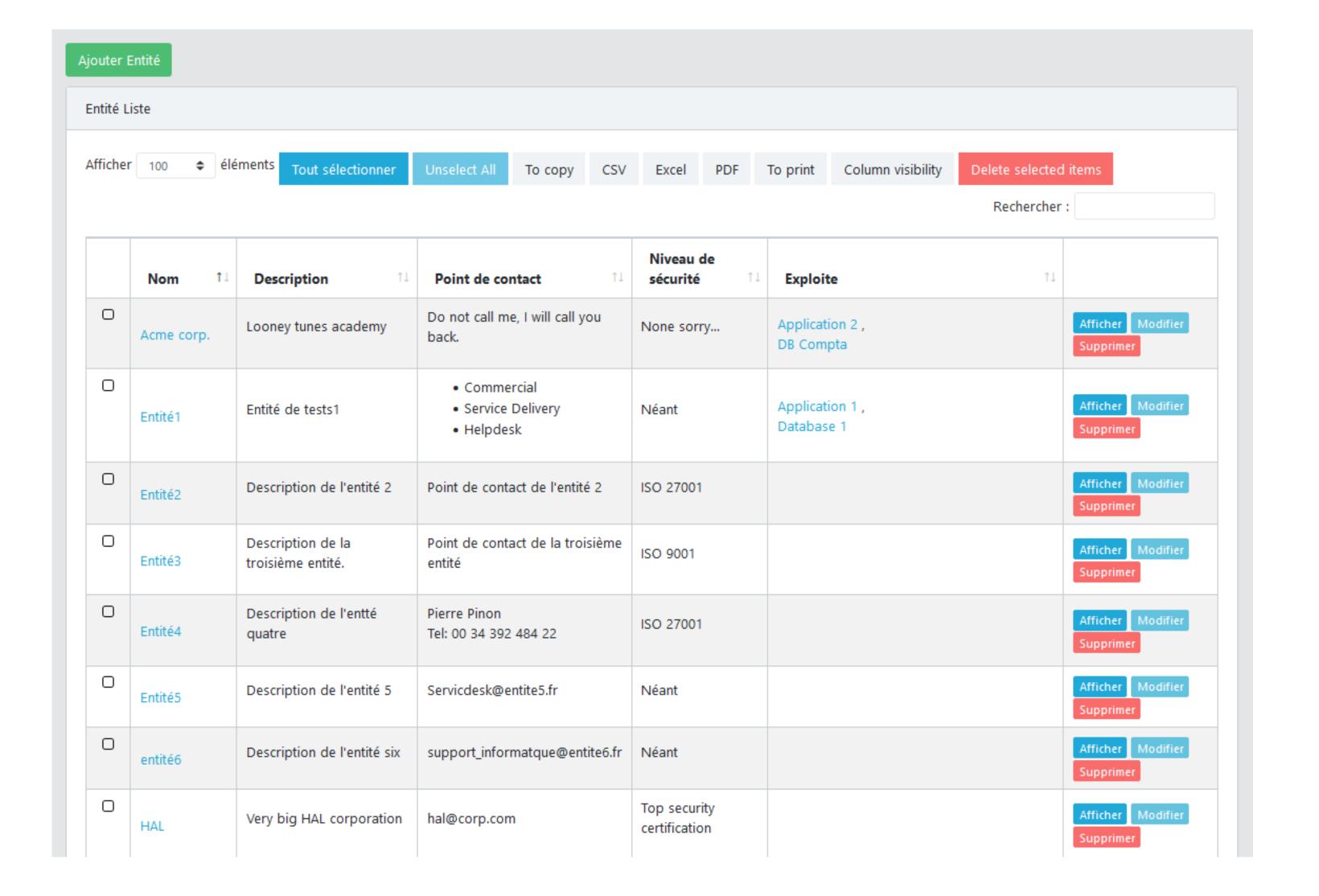
Left panel

- Data entry



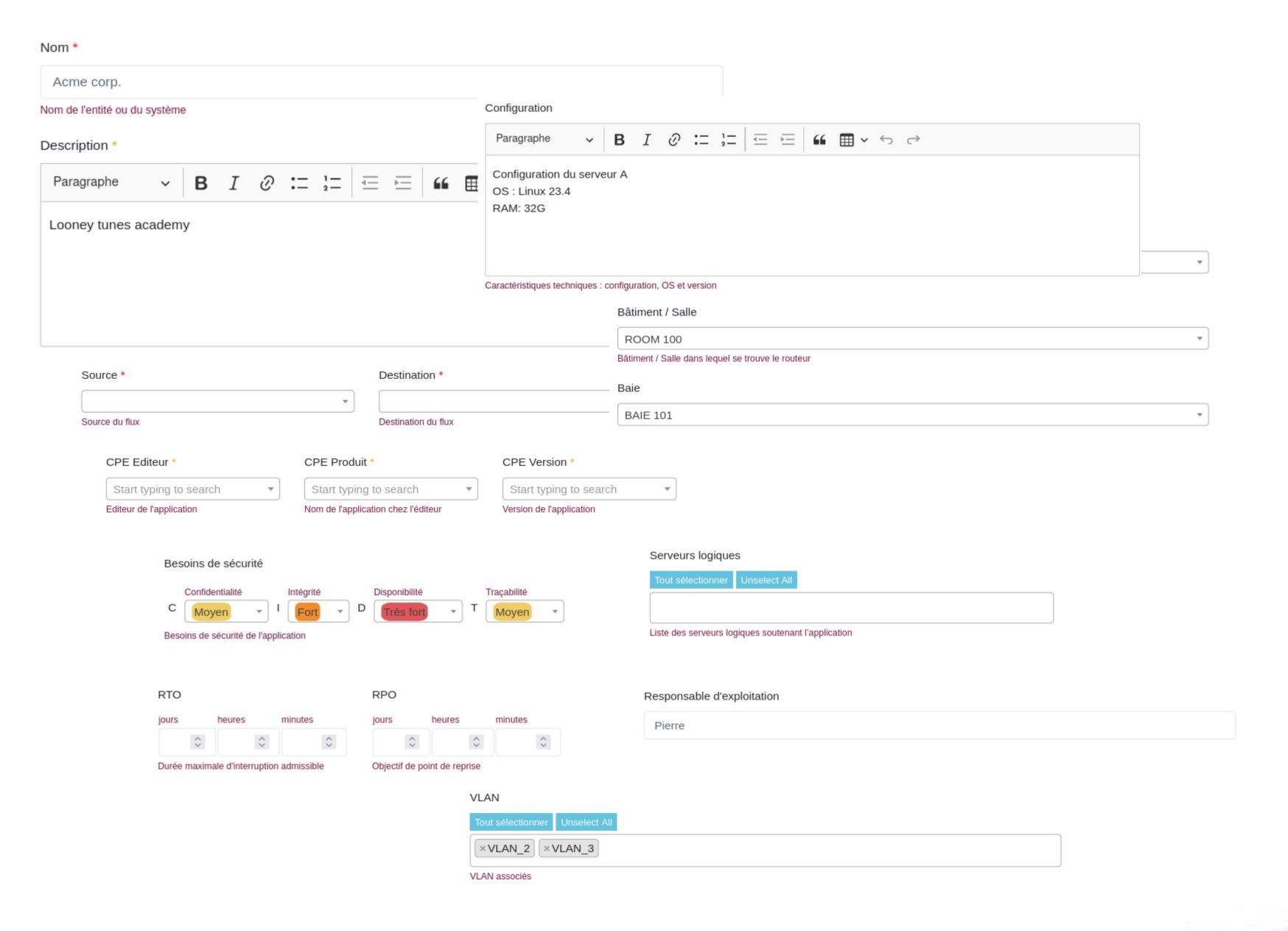
Lists

- Sort by column
- Search for
- Hide a column
- View / Modify / Delete
- Copy
- Print
- Export: Excel, PDF, CSV, ...

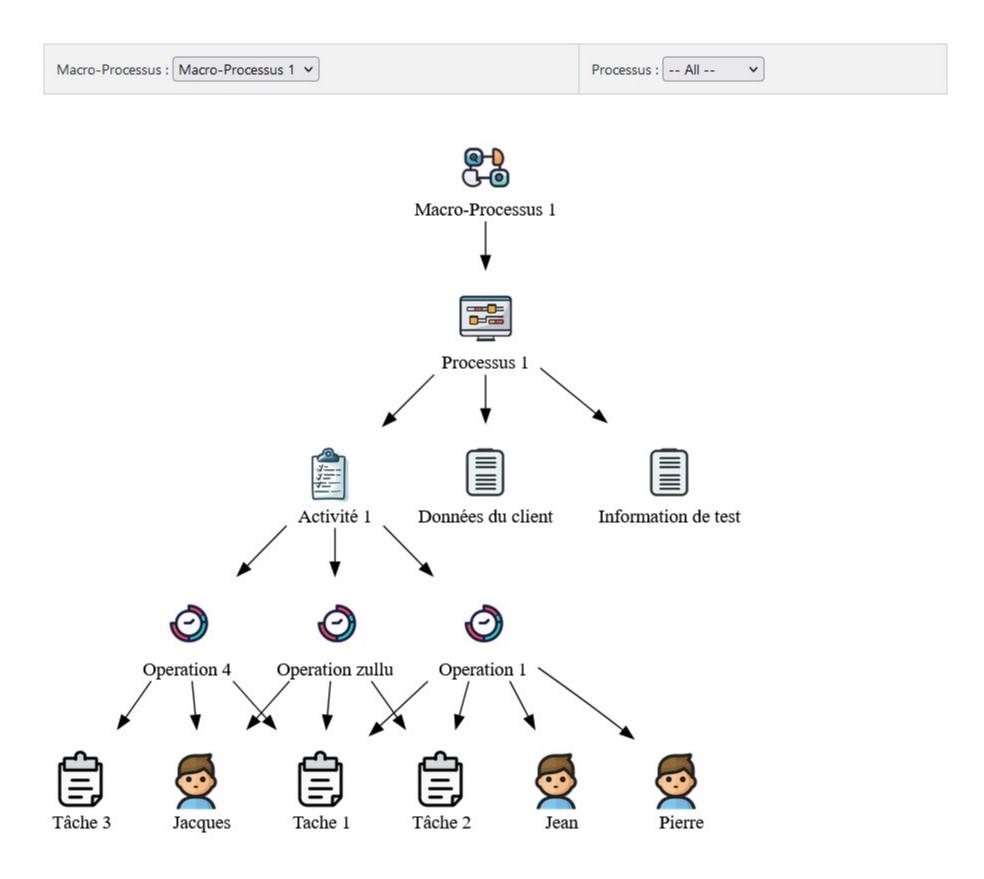


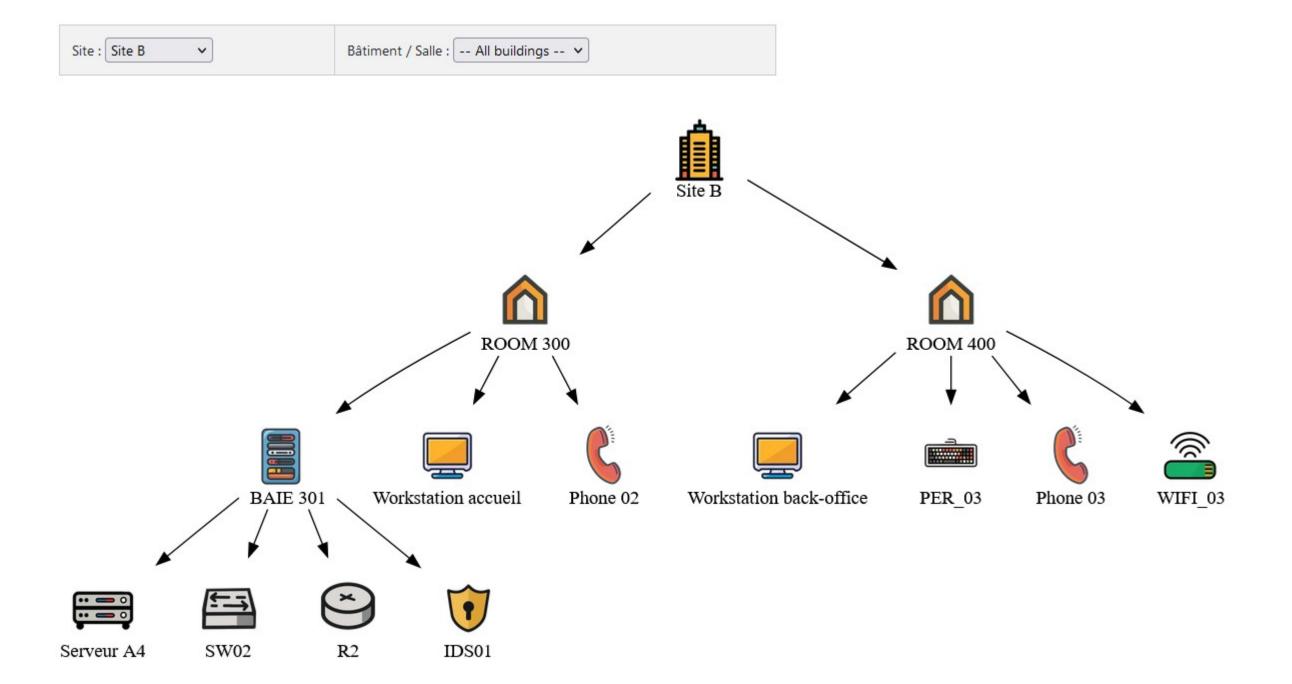
Forms

- RTF editor
- Drop-down lists
- Links between objects
- Security requirements
- Role management
- Change history



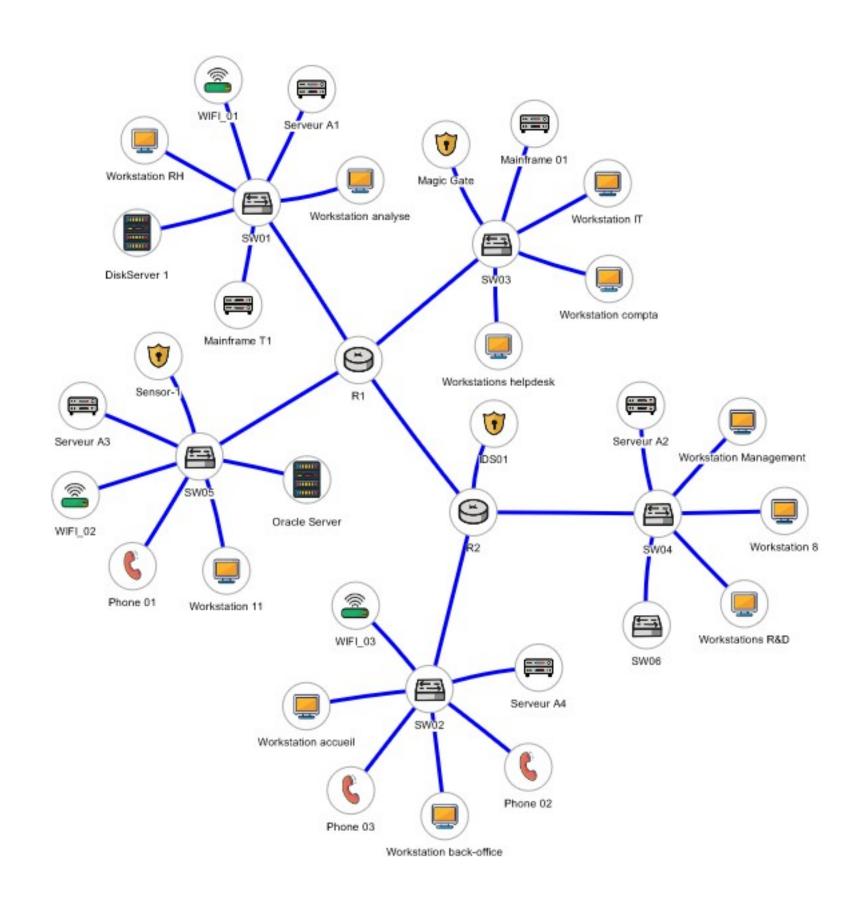
Links between objects

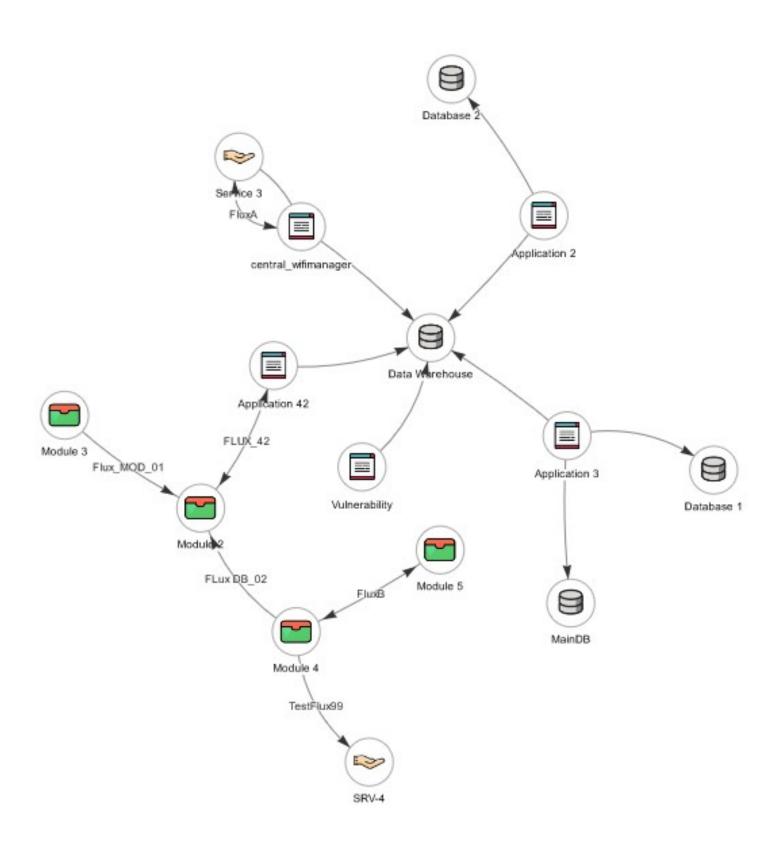




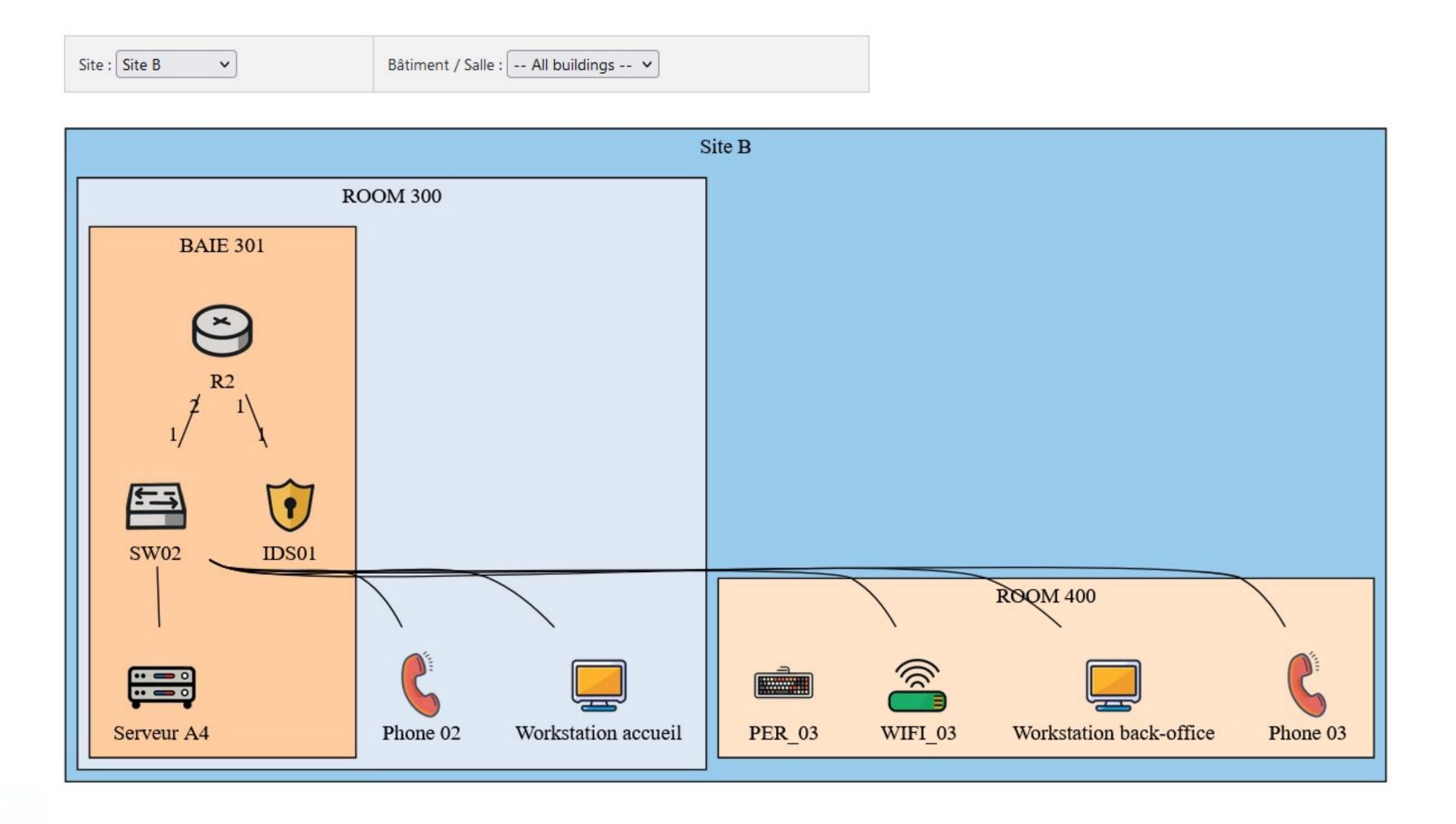
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Exploration





Network infrastructure



Reports

Information system mapping report

Lists

Supported entities and applications List of information system entities and their supported applications

Applications by application group List of applications by application group

Logical servers List of logical servers by applications and managers

Analysis of security requirements List of security requirements between macro-processes, processes, applications, databases and information.

Logical server configuration List of logical server configuration

Physical infrastructure inventory List of equipment by site/location

GDPR

Registers of processing operations

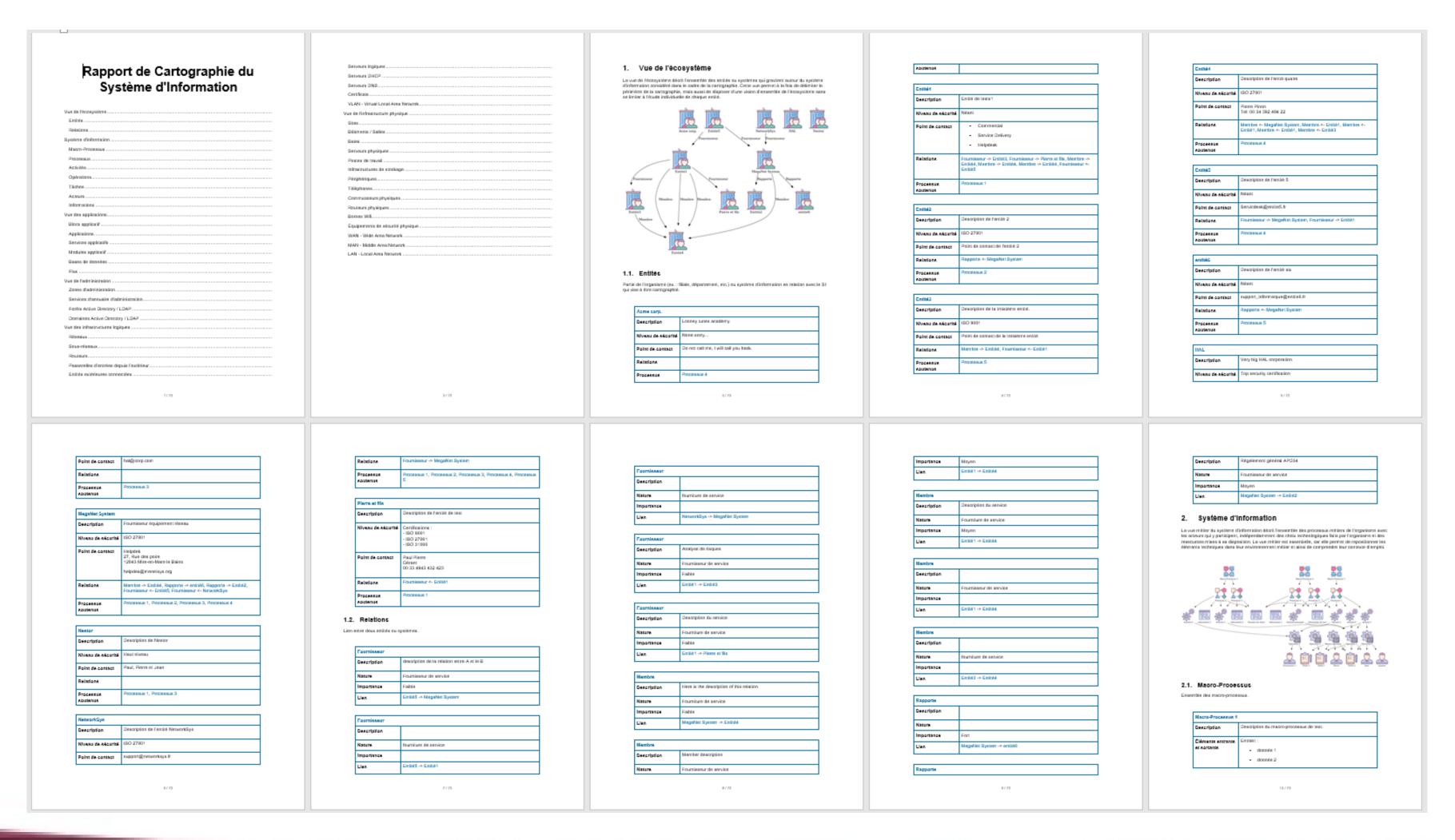
List of processing operations, applications, databases and related information.

Audit

Maturity levels Lists the levels of maturity achieved by the various mapping objects.

Updates / changes Traces the changes made to the map over the last 12 months

Information system mapping report



Physical inventory

List of equipment by site/location

1	Α	В	С	D	Е	F	G				
1	Site	Room	Bay	Asset	Name	Туре	Description				
2	Site A	Building 0		Workstation	Workstation 1	ThinThink 460	Station de travail compta				
3	Site A	Building 0	BAIE 101	Server	Mainframe 01	Type 404	Central accounting system				
4	Site A	Building 0		Workstation	Workstation 1	ThinThink 460	Station de travail compta				
5	Site A	Building 0	BAIE 101	Switch	Switch 2	Alcatel 430	Description switch 2				
6	Site A	Building 0	BAIE 101	Router	R1	Fortinet	Routeur prncipal				
7	Site A	Building 0	BAIE 101	Sécurité	Magic Gate	Gate	BIG Magic Gate				
8	Site A	Building 1		Phone	Phone 01	MOTOROAL 3110	Téléphone de test				
9	Site A	Building 1		Wifi	WIFI_02	ALCALSYS 3001	Borne Wifi 2				
10	Site A	Building 1	BAIE 102	Storage	Oracle Server	Oracle Server	Main oracle server				
11	Site A	Building 1		Phone	Phone 01	MOTOROAL 3110	Téléphone de test				
12	Site A	Building 1		Wifi	WIFI_02	ALCALSYS 3001	Borne Wifi 2				
13	Site A	Building 1	BAIE 103	Server	Serveur A3	System 840	Serveur mobile				
14	Site A	Building 1	BAIE 103	Storage	DiskServer 1	DiskServer 1	Description du serveur d stockage 1				
15	Site A	Building 1		Phone	Phone 01	MOTOROAL 3110	Téléphone de test				
16	Site A	Building 1		Wifi	WIFI_02	ALCALSYS 3001	Borne Wifi 2				
17	Site A	Building 2		Peripheral	PER_01	IBM 3400	important peripheral				
18	Site A	Building 2		Wifi	WIFI_01	Alcatel 3500	Borne wifi 01				
19	Site A	Building 2	BAIE 201	Server	Mainframe T1	HAL 340	Mainframe de test				
20	Site A	Building 2	BAIE 201	Server	Serveur A1	System 840	Description du serveur A1				
21	Site A	Building 2	BAIE 201	Switch	Switch de test	Nortel A39	Master test switch.				
22	Site A	Building 2		Wifi	WIFI_01	Alcatel 3500	Borne wifi 01				
23	Site B	Building 3		Workstation	Workstation 2	ThinThink 410	Station de travail accueil				
24	Site B	Building 3		Phone	Phone 02	IPhone 2	Description phone 02				
25	Site B	Building 3		Sécurité	Sensor-1	Sensor	Temperature sensor				
26	Site B	Building 3	BAIE 301	Server	Serveur A4	Mini 900/2	Departmental server				
27	Site B	Building 3		Workstation	Workstation 2	ThinThink 410	Station de travail accueil				
28	Site B	Building 3		Phone	Phone 02	IPhone 2	Description phone 02				
29	Site B	Building 3	BAIE 301	Switch	Switch 1	Nortel 2300	Desription du premier switch.				
30	Site B	Building 3	BAIE 301	Router	R2	CISCO	Routeur secondaire				
31	Site B	Building 3	BAIE 301	Sécurité	Magic Firewall	Firewall	The magic firewall - PT3743				
32	Site B	Building 4		Workstation	Workstation 3	ThinThink 420	Station de travail back-office				
33	Site B	Building 4		Peripheral	PER_03	HAL 8100	Space device				
34	Site B	Building 4		Phone	Phone 03	Top secret red phne	Special AA phone				
35	Site B	Building 4		Wifi	WIFI_03	SYSTEL 3310	Borne Wifi 3				
36	Site C	Building 5		Peripheral	PER_02	IBM 5600	Description				
37	Site C	Building 5	BAIE 501	Server	Serveur A2	System 840	Description du serveur A2				
38	Site C	Building 5	BAIE 501	Switch	Switch 3	Alcatel 3500	Desciption du switch 3				
39											
40											

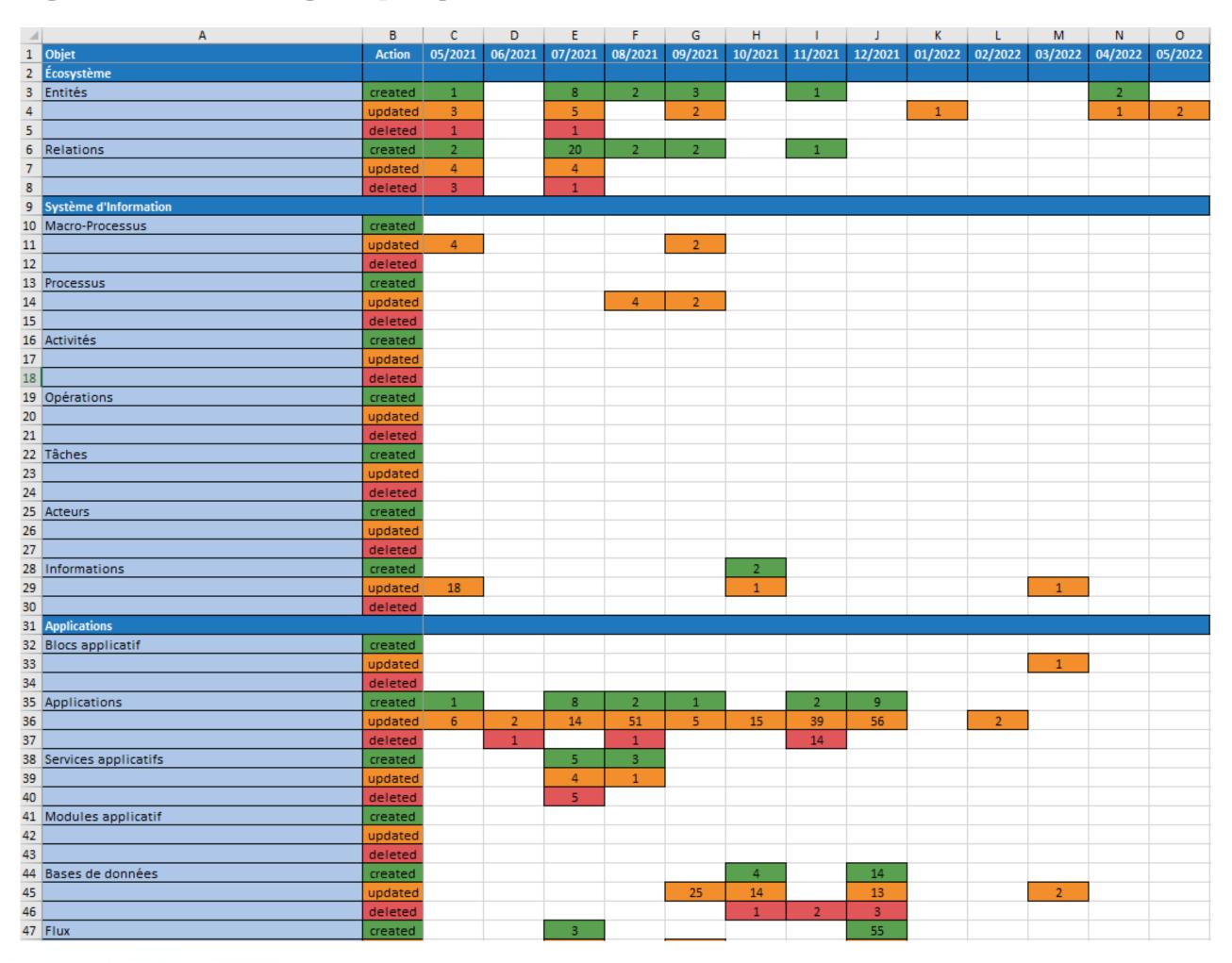
Analysis of security requirements

1	Α	ВС	DE	F	G	НΙ	J K	LMN	O P	Q	RS	T	U	VV	V X Y
1	Macro-Processus	CI	ΑT	Processus	C	ΙA	T Applications	CIA	T Bases de données	C	I A	١	Informations	C	I A T
2	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Application 1	111	1						
3	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Application 2	2 2 2	2 Database 2	1	1 1	1	information 2	2 :	111
4	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Application 2	2 2 2	2 Database 2	1	1 1	1	information 3	4 4	4 3 4
5	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Queue Manager	4 4 4	4 Database 1	1	2 3	4	Information 1	1	2 2
6	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 2	2 :	111
7	Macro-Processus 1	4 3	2 1	Processus 1	3	2 3	1 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 3	4 4	4 3 4
8	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Application 4	2 2 3	2 Data Warehouse	2	2 2	2	information 2	2 :	111
9	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Application 4	2 2 3	2 Data Warehouse	2	2 2	2 2	information 3	4 4	4 3 4
10	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Application 4	2 2 3	2 DB Compta	2	2 2	2	Données du client	2 2	2 2 2
11	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Application 4	2 2 3	2 DB Compta	2	2 2	2 2	Information 1	1	2 2
12	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Queue Manager	4 4 4	4 Database 1	1	2 3	4	Information 1	1	2 2
13	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Queue Manager	444	4 Database 1	1	2 3	4	information 2	2 :	111
14	Macro-Processus 2	1 2	3 4	Processus 3	3	2 3	1 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 3	4 4	4 3 4
15	Macro-Processus 2	1 2	3 4	Processus 4	4	2 2	2 Queue Manager	4 4 4	4 Database 1	1	2 3	4	Information 1	1	2 2
16	Macro-Processus 2	1 2	3 4	Processus 4	4	2 2	2 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 2	2 :	111
17	Macro-Processus 2	1 2	3 4	Processus 4	4	2 2	2 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 3	4 4	4 3 4
18	Macro-Processus 2	1 2	3 4	Processus 4	4	2 2	2 SuperApp	111	1						
19	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 2	2 2 2	2 Database 2	1	1 1	1	information 2	2 :	111
20	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 2	2 2 2	2 Database 2	1	1 1	1	information 3	4 4	4 3 4
21	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 3	1 2 3	3 Database 1	1	2 3	4	Information 1	1	2 2
22	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 3	1 2 3	3 Database 1	1	2 3	4	information 2	2 :	111
23	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 3	1 2 3	3 Database 1	1	2 3	4	information 3	4 4	4 3 4
24	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Application 3	1 2 3	3 MainDB	2	2 2	2	information 2	2 :	111
25	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Queue Manager	4 4 4	4 Database 1	1	2 3	4	Information 1	1	2 2
26	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 2	2 :	111
27	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Queue Manager	4 4 4	4 Database 1	1	2 3	4	information 3	4 4	4 3 4
28	Macro-Processus 3	2 2	2 2	Processus 2	3	4 2	4 Windows Calc	2 0 0	0						
29	Macro-Processus 3	2 2	2 2	Processus 5	4	3 2	3 Queue Manager	4 4 4	4 Database 1	1	2 3	4	Information 1	1 3	2 2
30	Macro-Processus 3	2 2	2 2	Processus 5	4	3 2	3 Queue Manager	444	4 Database 1	1	2 3	4	information 2	2 :	1 1 1
31	Macro-Processus 3	2 2	2 2	Processus 5	4	3 2	3 Queue Manager	444	4 Database 1	1	2 3	4	information 3	4	4 3 4
22							_								

Denormalise the links between macro-processes, processes, applications, databases and information

Analyse the differences in requirements between each object.

Updating the cartography



Track changes made to the map over the last 12 months

Track the updating of the map

Demonstrate that the map is regularly updated

Link with ISO 27001

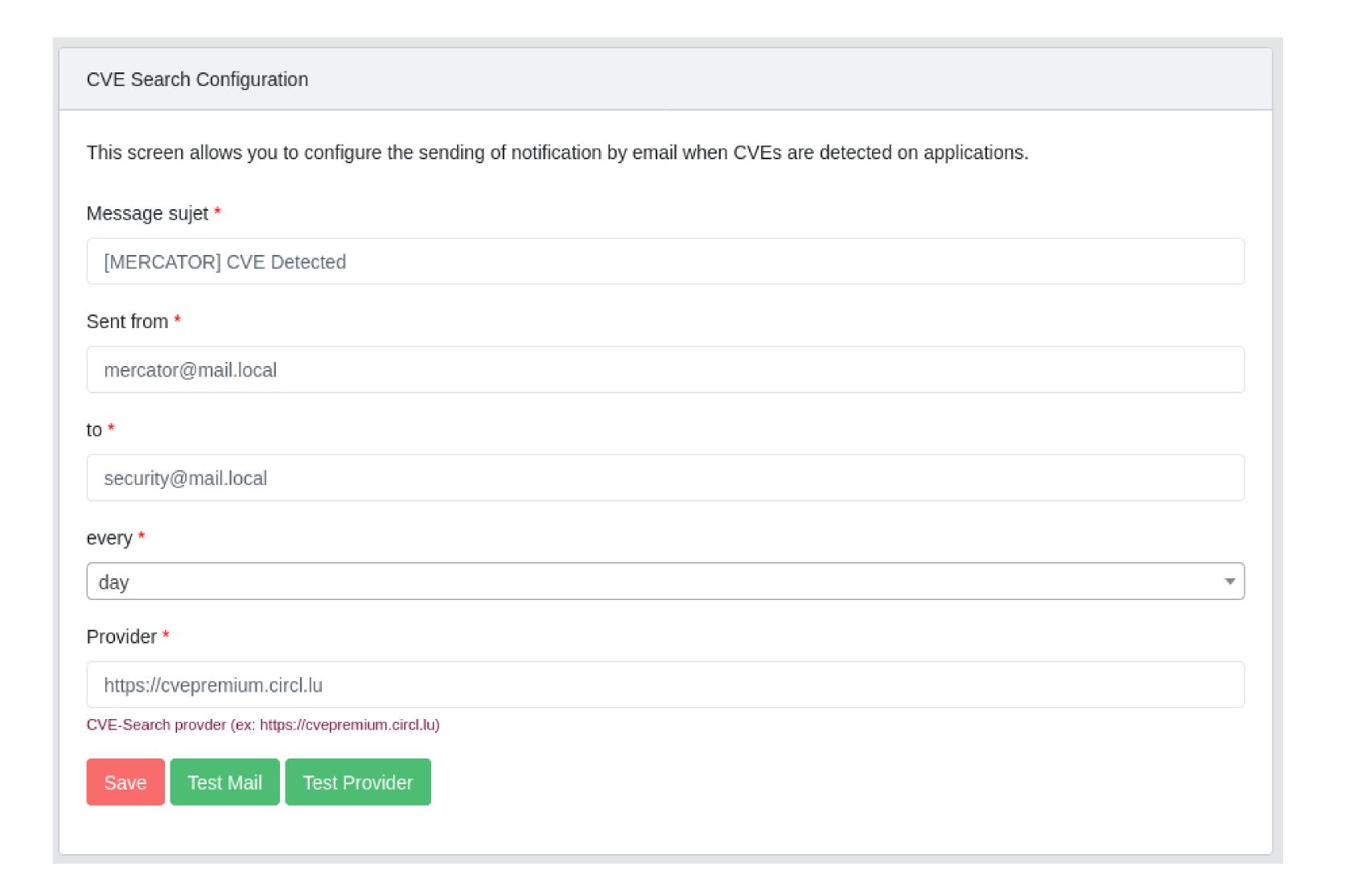


Section	Titre
A5.09	Inventory of information and other related assets
A.5.10	Proper use of information and other associated assets
A.5.12	Classification of information
A.7.08	Location and protection of equipment
A.8.32	Change management
A.8.06	Sizing
A.8.08	Management of technical vulnerabilities
A.8.23	Network partitioning
A.8.19	Information security in supplier relationships
A.5.24	Information security incident
A.8.14	Redundancy of information processing means

CVE Search

Detect CVEs based on the name of installed applications



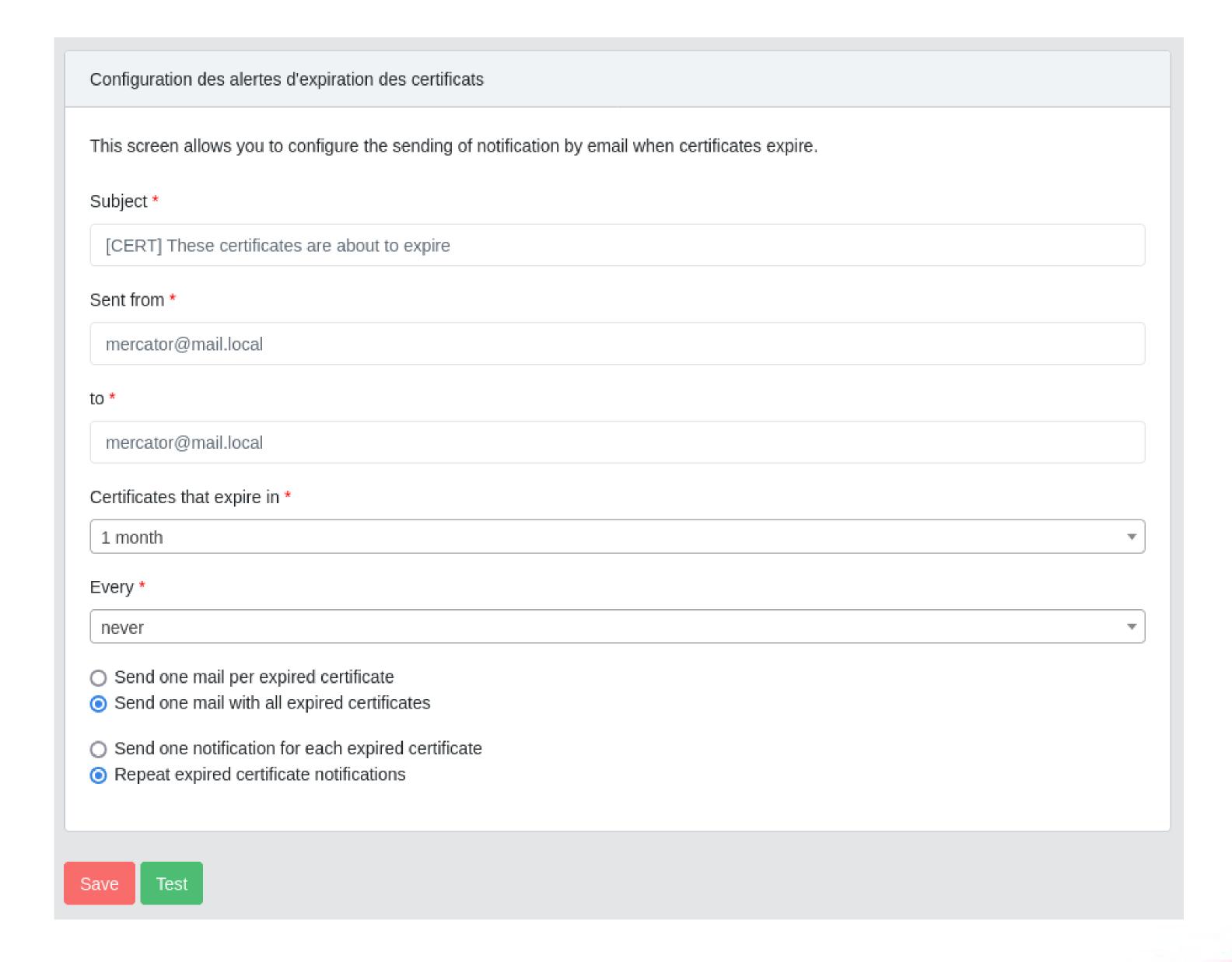


Certificate expiry

Send notifications before the certificate expiry date.

Ticket creation

Sending reminders



Application available on GitHub https://github.com/dbarzin/mercator under GPLv3 Open Source Licence

Users

Universities, Hospitals, Laboratories, Banks, Administrations

Contributions

15 contributors

Roadmap

Link with Monarc

