

Open Call 2

Webinar 3 | 29/10/2025 Brian Lee (TUS), Branka Stojanović (JR), Martin Husák (MUNI), Tajana Medaković & Antonio Damasceno (F6S)



Funded by the European Union



BUDGET

HORIZON-CL3-202 2-CS-01-01: HORIZON Innovation Actions



€5.6 million project budget

From which up to €360K will be granted to innovators in the Open Call #2

PROJECT DURATION





WHO WE ARE?

13 Partners

7 Countries

- TUS, Ireland [Coordinators]
- **GMV**, Spain
- MUNI, Czechia
- **SLP**, Ireland
- **F6S**, Ireland
- JR, Austria
- UMU, Spain
- **JAMK**, Finland
- ALIAS, Spain
- Inforcert, Italy
- MURC, Spain
- **KEMEA**, Greece
- MONT, France



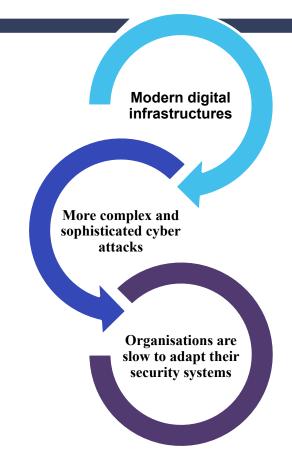
^{*}Royal Holloway And Bedford New College [associated partner]



Challenges

Modern digital infrastructures are complex and dispersed, leading to numerous attack vectors. Advanced persistent threats (APTs) target organizations with sophisticated, multi-vector attacks.

Many organizations are slow to adapt, needing modern security models like Zero Trust (ZT) and Secure Systems Edge (SSE) to manage these evolving threats.



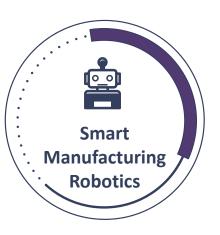


Resilmesh project aims to deliver an open and extensible security operations platform with advanced cyber situational awareness and detection/response capabilities to manage security and resilience in complex and dispersed digital services and infrastructures

FOCUS ON THREE STRATEGIC INFRASTRUCTURE CATEGORIES







- >> + 5 Open Call use cases
- >> 8 pilots in total
- >> 2 Open Calls

Project Specific Objectives

Improving end-to-end data aggregation and security control interoperability in dispersed digital infrastructures

Giving CSIRTs better awareness of the service and asset dependencies of their network

Helping CSIRTs to build cyber resilience capacity

Developing AI based algorithms and tools for early and ongoing attack detection and prediction

Developing a situation assessment system to view and forecast network level risk

Open Call #2

Challenges

BUDGET

Applications until Nov 5th 5PM CET

Evaluation &
Onboarding until
December

Extensions to Resilmesh via the collaboration mesh IRP's

New Analytic
Algorithms and
Architectures

Open Call 2 budget: €360K

5 projects
Up to 72K per project

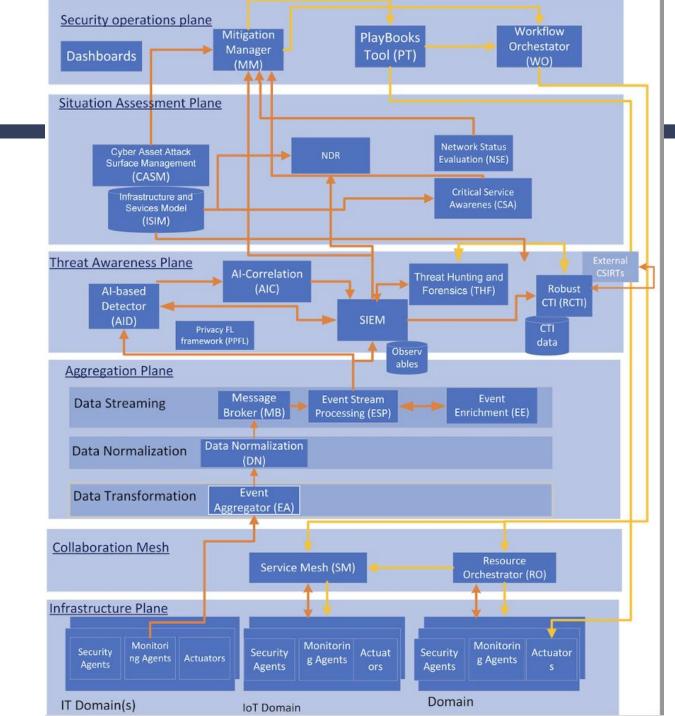
Projects' participation

Jan 2026 9 months **Sep 2026**



High level Architecture

- Aggregation Plane collects, aggregates, normalizes and streams data and events from multiple heterogeneous sources including logs, IDS, network
- Collaboration Mesh collaborating underlay enable the operation of the system across the dispersed digital infrastructure
- Threat Awareness Plane- suite of analytics functions to manage event correlation and alarming, attack detection and prediction, CTI sharing and threat hunting.
- **Situation Assessment Plane** captures dependencies between services onto the IT/OT resources that realise them; visualises the current network risk status; forecasts the near-term situation evolution
- **Security Operations Plane** automates and orchestrates response and mitigation actions



High level Architecture

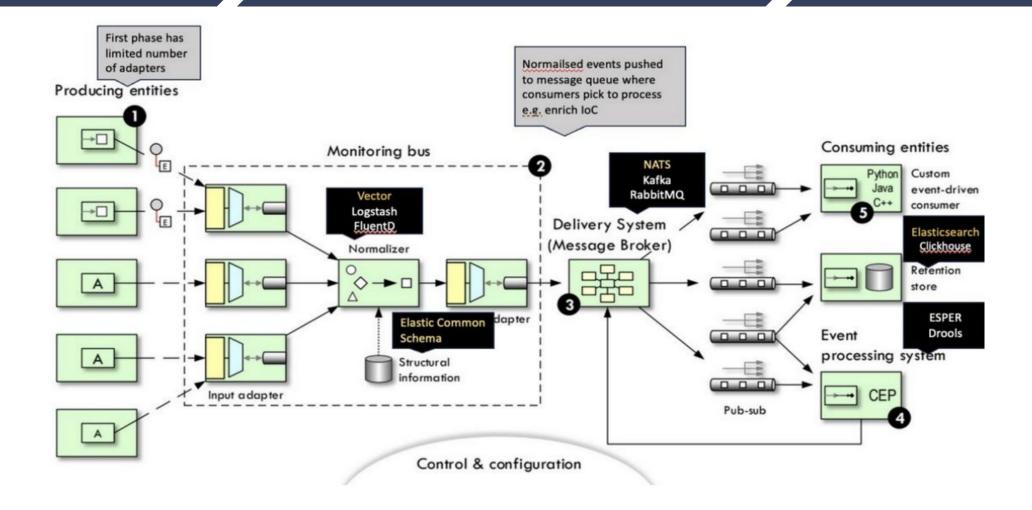


Figure 6 Resilmesh Aggregation and Service Layer Implementation Architecture

Challenge 1: Extensions to Resilmesh via the collaboration mesh IRP's

i) Connectivity Mesh

- Demonstrate how a K8S service mesh capability can provide adaptivity to improve the resilience of the Resilmesh platform
- Address known K8S security issues that could arise in the use of Kubernetes service mesh such as mTLS configuration issues,

ii) Interworking Mesh

 Extend the interoperability in the security application layers i.e. Threat Awareness, Situation Assessment and Security Operations- between Resilmesh components and other tools along the lines of the Open XDR Architecture (OXA) principles including the use of 'Meshroom' tool.



Connectivity Mesh

Connectivity Mesh = Service Mesh

- Linkerd
- Istio

Provides communication security and resilience

- Service Discovery
- Load Balancing
- Communication Resiliency
- Security Observability
- Routing Control
- API
- Fault Injection

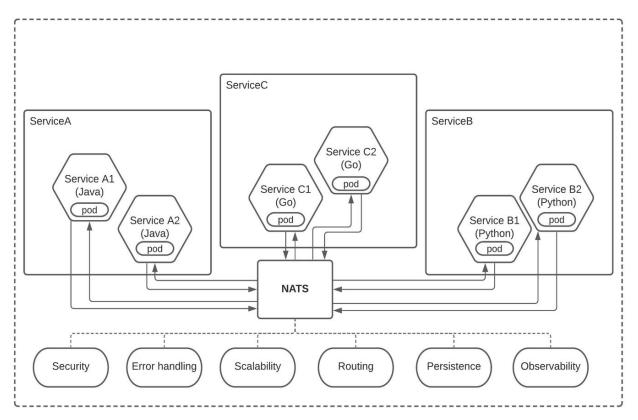


ResilmeshNATS as Service Mesh securing cuber infrastructures

NATS can be used to implement service mesh capability

- See "Using NATS to Implement Service Mesh Functionality"

https://dale-bingham-soteriasoftware.medium.com/using-nats-to-implement-service-mesh-functionality-part-1-sevice-discovery-5f2e6088843b







Connectivity Mesh Resilience

Service mesh offers service and communication security and resiliency

• How can these features be leveraged to improve the resiliency of the Resilmesh platform- specifically redundancy and dynamic positioning?



Resilmesh Platform Resilience

DYNAMIC POSITIONING:

Definition: Distribute and dynamically relocate functionality or system resource.

REDUNDANCY:

Definition: Provide multiple protected instances of critical resources.

Resilmesh Property/	
Resiliency Technique	Resilmesh Approach
Adaptive	Provide multiple protected
Redundancy (Platform)	instances of critical resources
• Dynamic Positioning (Platform)	Flexible function allocation and
Adaptive Response	composition
	Risk-based Mitigation Orchestration



^{*} Cyber Resilient Systems, NIST SP800 160 v2



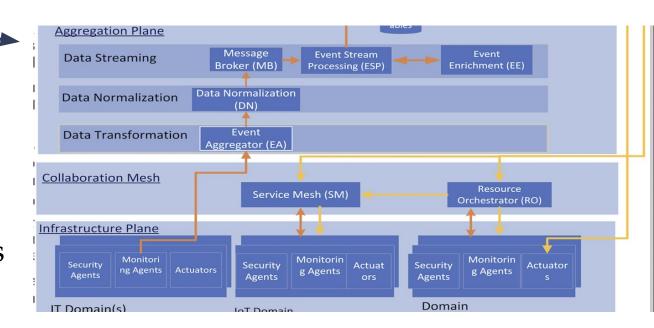
Service mesh to provide resilience

- How can a NATS service mesh be used to resilience in the Resilmesh platform? E.g.
 - If a Vector gateway fails; (reroute to alternative DP)
 - If the event enrichment fails; (reroute / reconfigure)
 - If the the SIEM fails can a secondary SIEM be used (redundancy)
 - provide duplicated connection / fail over connection to high value components e.g. ISIM, SIEM, MM



Resilmesh Platform K8S evaluation

- The Resilmesh platform must be deployed using K8S
- Evaluate known security issues such as
 - mTLS configuration issues,
 - sidecar injection vulnerabilities,
 - lack of ingress/egress controls,
 - certificate and key management risks
 - etc.







Interoperability Mesh

• Use of open protocols, standards and best practices to enable ease of *integration* and *cooperation* between security applications/controls including third party tools



Interoperability & Integration best practices

- Create a collaborative system of tools and controls to secure complex and dispersed distributed enterprise *, **.
- Adopt integration best practices through a mix of open standards and interfaces, proprietary APIs, and point integrations*, **
- Consolidated dashboards providing end-to-end visibility on security tasks and risks*
- * Cybersecurity Mesh, Gartner, ** Open Cyberecurity Alliance (OCA) Open XDR



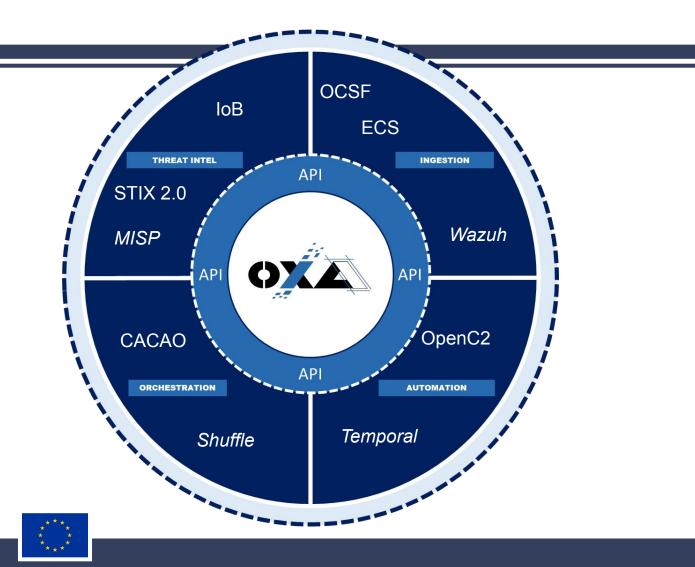


OpenXDR -OXA

OXA is a common set of libraries and interfaces that allows cybersecurity industry to interact

https://github.com/opencybersecurityalliance/oxa

IoB - Indicators of Behaviour





Resilmesh Integration reference Point (IRP)

- Sensor IRP (SIRP) -the point at which security events and logs are ingested in the system from security sensors shown as monitoring agents in the Infrastructure Plane.
- Connectivity IRP (CIRP) provides connectivity and message delivery from any functional component to any other functional component across any type or range of network. The CIRP is implemented by the Message Broker by default NATS
- Wazuh IRP (WIRP)- Wazuh plays a critical role as an integration function in Resilmesh. It can forward both unprocessed events (logs) or actual alerts to other applications and it also provides a query based API to allow applications to access its data.

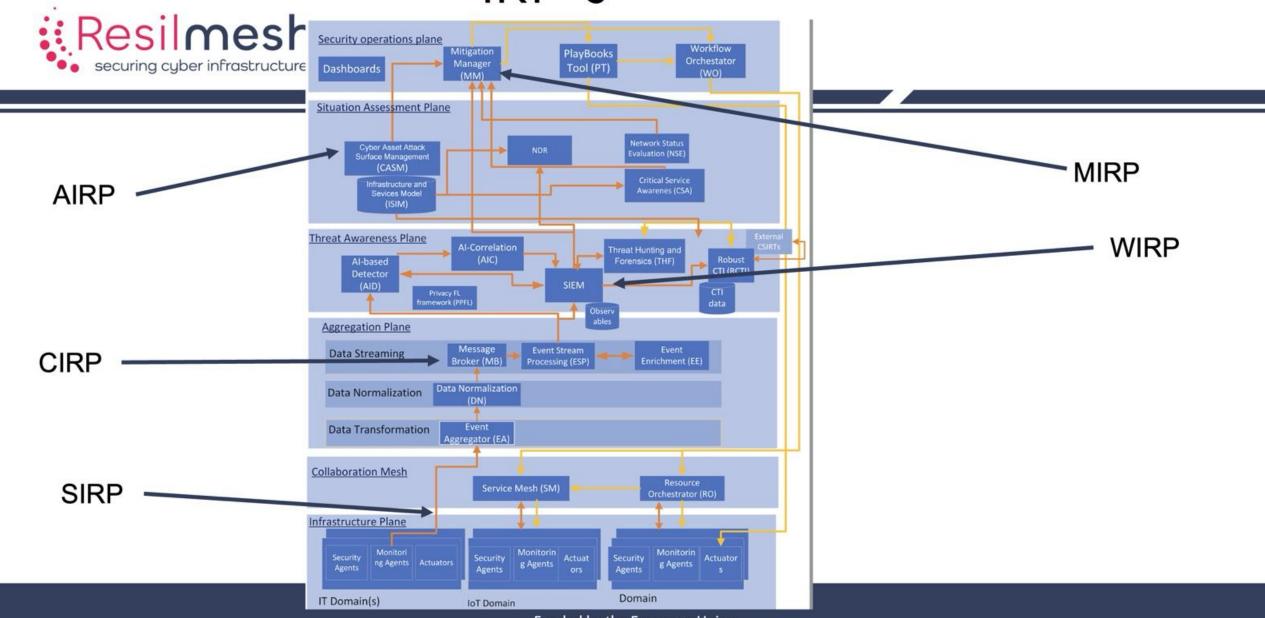




Resilmesh Integration reference Point (IRP)

- Wazuh IRP (WIRP)- Wazuh plays a critical role as an integration function in Resilmesh. It can forward both unprocessed events (logs) or actual alerts to other applications and it also provides a query based API to allow applications to access its data.
- Asset IRP (AIRP)- This IRP gives access to the asset management database to security applications for risk calculation, mission criticality analysis, attack mitigation manager, etc. This IRP is provided by the ISIM and CASM functional components.
- *Mitigation MIRP* integrating new controls to the MM via OpenC2

IRP's



Funded by the European Union

Challenge 2: New Analytic Algorithms and Architectures

i) User and Entity Behaviour Analytics (UEBA)

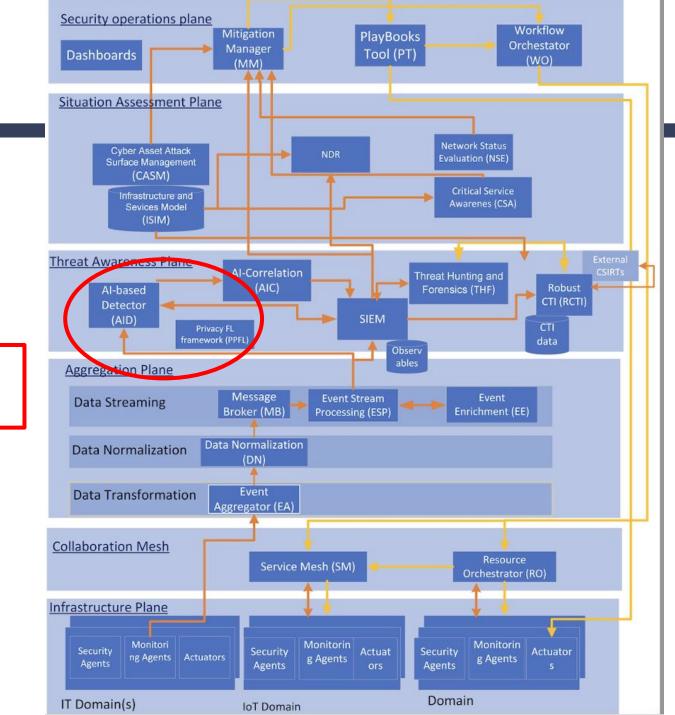
UEBA can apply to both endpoint and network traffic behaviours. One approach here could be to extend the Resilmesh NDR functional component with network behaviour analytics

ii) Novel edge AI AD architectures

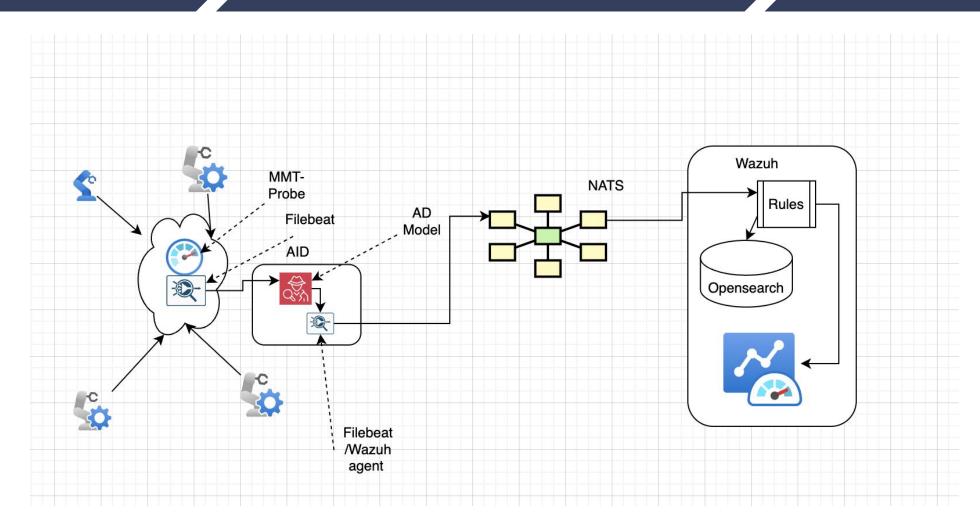
- Ensemble methods
- Distributed deep learning
- Incremental learning
- Edge-to-Edge Collaborative Anomaly Detection

High level Architecture

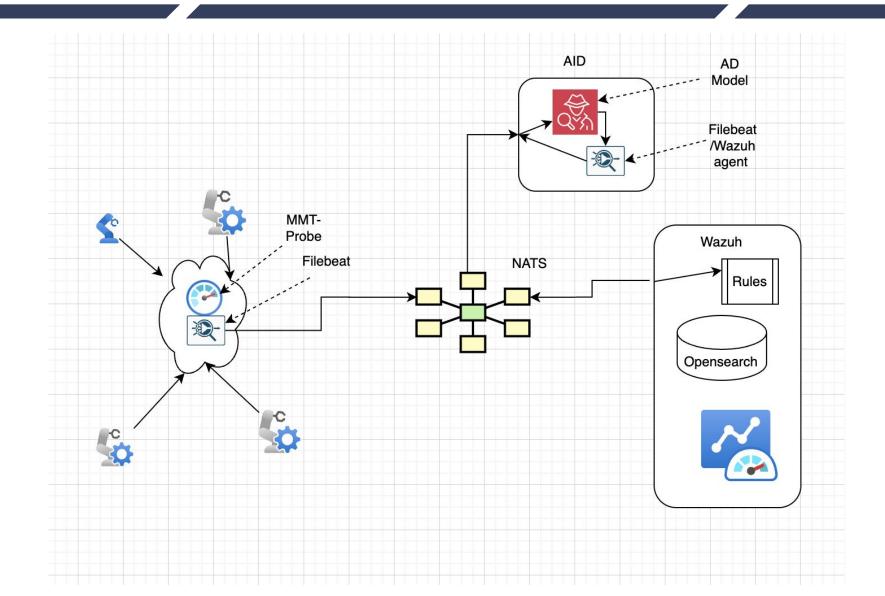
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AID: Edge analytics and detection

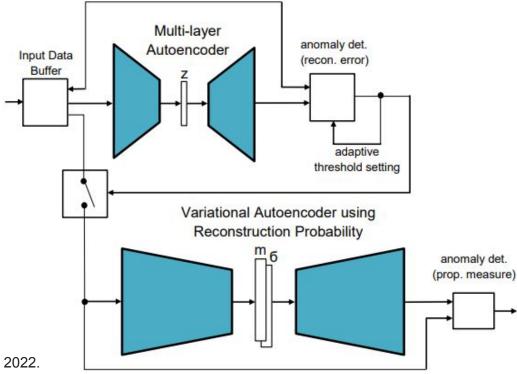


AID: Centralised detection

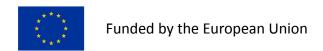


AID: Autoencoders

 Two-stage anomaly detection using stacked Autoencoders



Neuschmied, H., Winter, M., Stojanović, B., Hofer-Schmitz, K., Božić, J. and Kleb, U., 2022. Apt-attack detection based on multi-stage autoencoders. *Applied Sciences*, *12*(13), p.6816. https://www.mdpi.com/2076-3417/12/13/6816



AID: Data sources

Network traffic – NetFlow data

No.	timestamp	Time	Source	Destination	Protocol Length	Info
	1 2023-01-22 04:10:36,642504	0.000000	185.175.0.3	185.175.0.4	TCP	66 51094 → 502 [ACK] Seq=1 Ack=1 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	2 2023-01-22 04:10:36,642516	0.000012	185.175.0.4	185.175.0.3	TCP	66 502 → 51092 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197813679
	3 2023-01-22 04:10:36,642527	0.000023	185.175.0.3	185.175.0.4	TCP	66 51092 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	4 2023-01-22 04:10:36,642540	0.000036	185.175.0.4	185.175.0.3	TCP	66 502 → 51090 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197813658
	5 2023-01-22 04:10:36,642550	0.000046	185.175.0.3	185.175.0.4	TCP	66 51090 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	6 2023-01-22 04:10:36,642564	0.000060	185.175.0.4	185.175.0.3	TCP	66 502 → 51088 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197808652
L	7 2023-01-22 04:10:36,642574	0.000070	185.175.0.3	185.175.0.4	TCP	66 51088 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	8 2023-01-22 04:10:36,642588	0.000084	185.175.0.4	185.175.0.3	TCP	66 502 → 51086 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197808630
	9 2023-01-22 04:10:36,642598	0.000094	185.175.0.3	185.175.0.4	TCP	66 51086 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	10 2023-01-22 04:10:36,642611	0.000107	185.175.0.4	185.175.0.3	TCP	66 502 → 51084 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197808608
	11 2023-01-22 04:10:36,642621	0.000117	185.175.0.3	185.175.0.4	TCP	66 51084 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	12 2023-01-22 04:10:36,642634	0.000130	185.175.0.4	185.175.0.3	TCP	66 502 → 51082 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197808585
	13 2023-01-22 04:10:36,642645	0.000141	185.175.0.3	185.175.0.4	TCP	66 51082 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	14 2023-01-22 04:10:36,642657	0.000153	185.175.0.4	185.175.0.3	TCP	66 502 → 51080 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197808563
	15 2023-01-22 04:10:36,642667	0.000163	185.175.0.3	185.175.0.4	TCP	66 51080 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	16 2023-01-22 04:10:36,642681	0.000177	185.175.0.4	185.175.0.3	TCP	66 502 → 51078 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197803556
	17 2023-01-22 04:10:36,642691	0.000187	185.175.0.3	185.175.0.4	TCP	66 51078 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	18 2023-01-22 04:10:36,642705	0.000201	185.175.0.4	185.175.0.3	TCP	66 502 → 51076 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197803534
	19 2023-01-22 04:10:36,642716	0.000212	185.175.0.3	185.175.0.4	TCP	66 51076 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	20 2023-01-22 04:10:36,642729	0.000225	185.175.0.4	185.175.0.3	TCP	66 502 → 51074 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197803512
	21 2023-01-22 04:10:36,642740	0.000236	185.175.0.3	185.175.0.4	TCP	66 51074 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	22 2023-01-22 04:10:36,642753	0.000249	185.175.0.4	185.175.0.3	TCP	66 502 - 51072 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197803489
	23 2023-01-22 04:10:36,642763	0.000259	185.175.0.3	185.175.0.4	TCP	66 51072 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	24 2023-01-22 04:10:36,642775	0.000271	185.175.0.4	185.175.0.3	TCP	66 502 → 51070 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197803468
	25 2023-01-22 04:10:36,642785	0.000281	185.175.0.3	185.175.0.4	TCP	66 51070 → 502 [ACK] Seq=1 Ack=2 Win=502 Len=0 TSval=4197859519 TSecr=1694360154
	26 2023-01-22 04:10:36,642801	0.000297	185.175.0.4	185.175.0.3	TCP	66 502 → 51068 [FIN, ACK] Seq=1 Ack=1 Win=509 Len=0 TSval=1694360154 TSecr=4197798461

ts	src_ip	src_port dst_ip	dst_port proto	service	duration	src_bytes	dst_bytes	conn_state	missed_byte	src_pkts	src_ip_bytes dst_pkts	c	dst_ip_bytes
1554198358	3.122.49.24	1883 192.168.1.152	52976 tcp	ŭ.	8.054.953.026	1762852	41933215	ОТН	0	252181	14911156	2	236
1554198358	192.168.1.79	47260 192.168.1.255	15600 udp	н	0	0	0	SO SO	0	1	63	0	0

dns_query	dns_qclass	dns_qtype	dns_rcode	dns_AA	dns_RD	dns_RA	dns_rejecte	ssl_version	ssl_cipher	ssl_resumed	ssl_establish	ssl_subject	ssl_issuer
-	0	C) (0 -	-	-	-	_	-	-	-	_	-
_	0) () -	_	_	_	_	_	_	_	_	_

http_trans_o	http_metho	http_uri	http_referre	http_version	http_reques	http_respon	http_status_	http_user_a	aghttp_orig_m	http_resp_n
- 101	-	-	-	_ 1141	0	0	0	- 11	<u>_</u>	
-	-	-	-	-	0	0	0	-	-	-



AID: Data sources

· Sensor readings (e.g. temperature, humidity...)

Log files

```
66.249.66.192 - - [21/Jun/2018:02:08:49 +0200] "GET /sitemap_index.xml HTTP/1.1" 301 -
"-" "Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.192 - - [21/Jun/2018:02:08:49 +0200] "GET /sitemap.xml HTTP/1.1" 200 1637 "-"
"Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.221 - - [21/Jun/2018:02:20:18 +0200] "GET /amp/seo/optimisation-on-site/
analyse-de-logs.html HTTP/1.1" 200 9293 "-" "Mozilla/5.0 (Linux; Android 6.0.1; Nexus 5X
Build/MMB29P) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.96 Mobile Safari/
537.36 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.223 - [21/Jun/2018:02:20:24 +0200] "GET /amp/skin/frontend/amp/custom/fonts/
opensans-bold-webfont.woff2 HTTP/1.1" 200 19676 "-" "Mozilla/5.0 (Linux; Android 6.0.1;
Nexus 5X Build/MMB29P) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.96 Mobile
Safari/537.36 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.221 - - [21/Jun/2018:02:20:30 +0200] "GET /amp/skin/frontend/amp/custom/fonts/
opensans-bold-webfont.woff HTTP/1.1" 304 - "-" "Mozilla/5.0 (Linux; Android 6.0.1; Nexus
5X Build/MMB29P) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.96 Mobile
Safari/537.36 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.221 - - [21/Jun/2018:02:30:52 +0200] "GET /media/css secure/
dc99e6e3eebcaa34d571d04b205401d0.css HTTP/1.1" 200 1571 "https://www.410-gone.fr/e-
commerce/magento/developpeur-magento/expert-magento/certifications/frontend-
developer.html" "Mozilla/5.0 AppleWebKit/537.36 (KHTML, like Gecko; compatible;
Googlebot/2.1; +http://www.google.com/bot.html) Safari/537.36"
66.249.66.223 - [21/Jun/2018:03:45:46 +0200] "GET /architecture-web/apache.html HTTP/
1.1" 200 5383 "-" "Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/
bot.html)"
66.249.66.221 - [21/Jun/2018:04:02:46 +0200] "GET /amp/seo/optimisation-on-site/robots-
txt.html HTTP/1.1" 200 7454 "-" "Mozilla/5.0 (Linux; Android 6.0.1; Nexus 5X Build/
MMB29P) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.96 Mobile Safari/537.36
(compatible; Googlebot/2.1; +http://www.google.com/bot.html)"
66.249.66.223 - [21/Jun/2018:04:02:48 +0200] "GET /amp/skin/frontend/amp/custom/fonts/
opensans-bold-webfont.woff2 HTTP/1.1" 200 19676 "-" "Mozilla/5.0 (Linux: Android 6.0.1:
Nexus 5X Build/MMB29P) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2272.96 Mobile
                  Image source: https://www.semrush.com/blog/log-file-analysis/
```

Example - D3FEND

Network Traffic Community Deviation

D3-NTCD

D3-NTCD (Network Traffic Community Deviation)

Definition

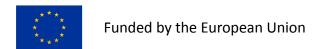
Establishing baseline communities of network hosts and identifying statistically divergent inter-community communication.

How it works

Hosts/users within a computer network are analyzed to identify communities of hosts which frequently communicate. Future communications between communities that don't usually communicate can then be detected. For example, if a community of hosts that communicate in support of a company's finance division suddenly starts to access the code server usually accessed only by engineers, this may indicate unauthorized activity.

Considerations

- Potential for false positives in very dynamic network environments.
- Attackers that move low and slow may not differentiate their behavior enough to trigger an alert.



NDR base - Montimage MMT

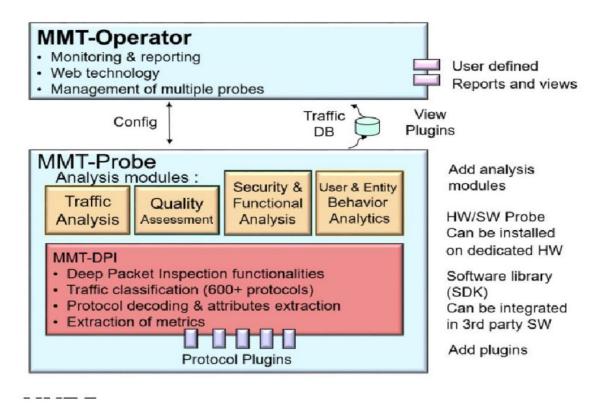


Figure 27 - NDR based on MMT

https://www.montimage.com/products/MMT Brochure.pdf

For more Information:

D2.3 System Architecture v2

https://resilmesh.eu/wp-content/uploads/2025/09/Resilmesh-D2.3-0725-Resilmesh-Architecture-v2-B.pdf

• D3.1 Resilmesh Platform Reference Implementation

https://resilmesh.eu/wp-content/uploads/2024/07/Resilmesh D3.1-0224 Platform Reference Implementation- A-1.pdf

HOW TO PARTICIPATE?



Are you:

- 1. Legal entity or
- 2. Consortia of legal entities

Elligible entities: mid-caps, SMEs or research organisations (RTOs or academia).

ADDITIONAL
ELLIGIBILITY
CRITERIA

Are you:

- **1. based** in an eligible country?
- 2. addressing of the two challenges?

PREPARE APPLICATION

- 1. Attend webinars
- 2. Check out FAQ
- 3. Check out all the documents that you need to submit

SUBMIT APPLICATION

Apply to an open call submitting a detailed version of your project

BEFORE 05/11/2025 17:00 CET 40

TRANSFORMATION

Once accepted:
Initiate your
transformation
project, being
accompanied during
the process



Step 1: Resilmesh website



Open Call 2 – Call for submissions

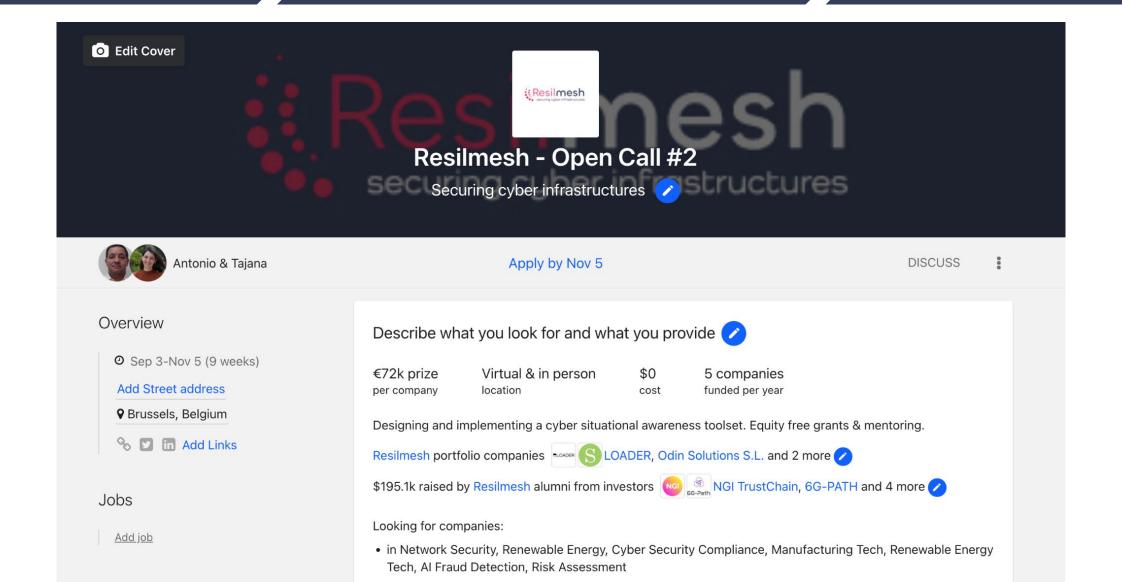
Apply by 05/11/2025 5:00 PM CET



Overview

Resilmesh aims at addressing major challenges for security teams, namely an increase in digital infrastructure attack surfaces and their complexity and sophistication, combined with a slow adaptation of organisations' security systems regarding their security architectures, practices and infrastructure. To this end, Resilmesh will help organisations achieve higher levels of security and resilience by providing them with methods and tools to better manage the complexity of their digital infrastructures and services, combat advanced persistent threats.

Step 2: F6S platform



Step 3: Application form

Proposal	Title *
Proposal	Acronym *
Should be di	fferent than the Proposal name
Proposal	Summary *
	de a detailed summary that will be used for promotional purposes and made public.
Maximum ler	ngth 1500 characters (including spaces).

SECTION 2: Applicant information

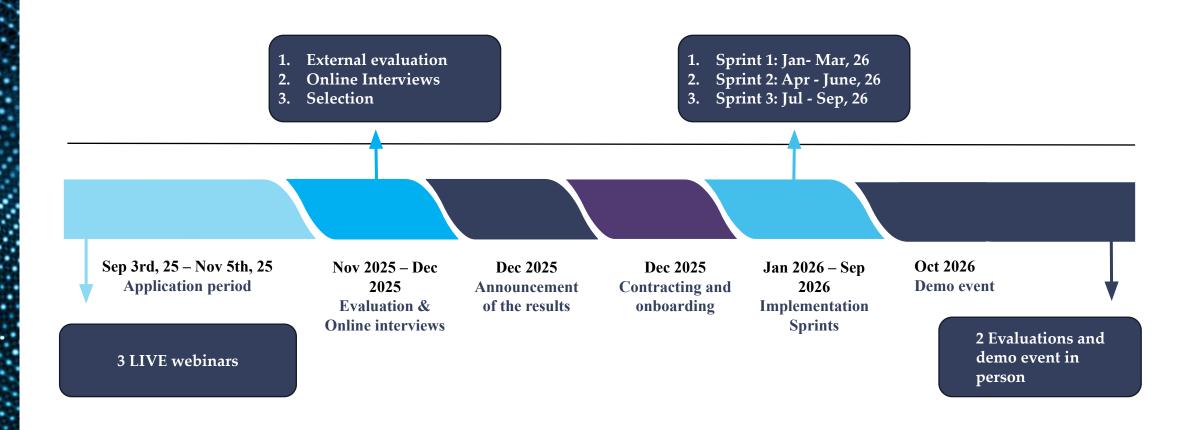
According to Guidelines for applicants Resilmesh Open Call #2 will finance

- Single entity Micro, small and medium-sized enterprises (SMEs)
 OR
- Consortium of maximum of 2 entities Micro, small and medium-sized enterprises (SMEs)

Please note to justify the role of each organisation, and the capacity in terms of expertise and resources for the selected topic in the Annex 2 Proposal Technical Annex (template).

In case of a single entity application "Applicant 2" fields should not be answered.

TIMELINE





Thank you for your attention! Apply before: 05/11 [05:00 PM CET] Questions?





More information:



www.resilmesh.eu



Ask questions directly:

Help desk: resilmesh@f6s.com

F6S discussion board:

www.f6s.com/resilmesh-open-call-1/discuss



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