

Ελλάδα, 2024-2030

Στελεχιακό Δυναμικό Κυβερνοασφάλειας

Επιτακτική ανάγκη - Πλήρης ανεπάρκεια



Δημήτρης Α. Γκριτζαλης

Καθηγητής Κυβερνοασφάλειας &
Δ/ντης Μεταπτυχιακών Σπουδών

Τμήμα Πληροφορικής
Οικονομικό Πανεπιστήμιο Αθηνών

 CyberHubs



Co-funded by
the European Union

Κυβερνοασφάλεια Κομβικό ζητούμενο σε αυξανόμενη ανεπάρκεια



2024 Cyberthreat Defense Report

SURVEY DEMOGRAPHICS

- 17** Countries represented around the world
- 19** Industries represented
- 1,200** Qualified IT security decision makers & practitioners

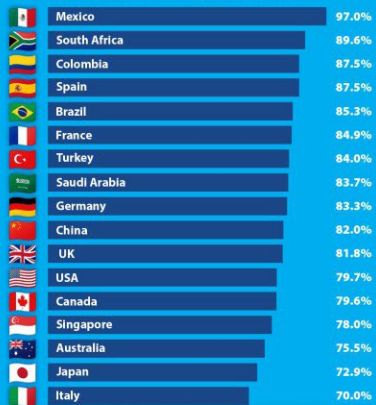
TURNAROUND CONFIRMED

Reversing a rising trend from 2014 to 2022, the percentage of organizations compromised by a successful cyberattack declined for the third consecutive year, falling to 81.5%.



COMPROMISED ORGANIZATIONS BY COUNTRY

The percentage of organizations that were victimized by at least one successful attack in the past 12 months.



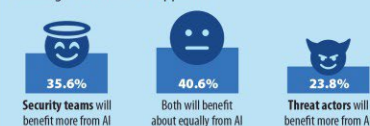
FOREMOST THREATS

The cyberthreats causing the greatest concern:

- 1 Malware
- 2 Phishing / spear-phishing attacks
- 3 Account takeover / credential abuse attacks
- 4 Ransomware

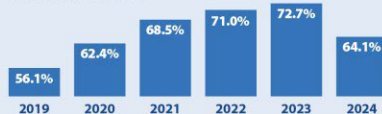
AI A FORCE FOR GOOD IN CYBERSECURITY?

Will AI provide more benefits to security teams or to threat actors? Significantly more security professionals believe they will gain an advantage than think the opposite.



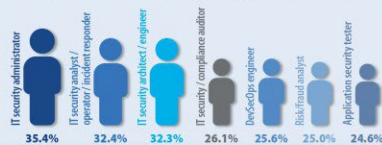
FEWER ORGANIZATIONS AFFECTED BY RANSOMWARE

The percentage of organizations victimized by ransomware was the lowest in four years.



WIDESPREAD SECURITY SKILLS SHORTAGE

Eighty-six percent of organizations are experiencing a shortfall of skilled IT security personnel. Openings are spread across many roles:



POSITIVE OUTCOMES FROM AI

Security professionals expect AI to help them improve their ability to:



BOARDS ADDING CYBERSECURITY EXPERIENCE

A surprising number of boards of directors include at least one member with a cybersecurity background.



HOW TO IMPROVE JOB SATISFACTION

The top four ways to improve job satisfaction and employee retention in the organization's cybersecurity organization:

- 1 Cybersecurity training and certification
- 2 Increased compensation
- 3 Work schedule flexibility
- 4 Job performance recognition / awards

HOTTEST SECURITY TECH FOR 2024

The security solutions with the highest "plan for acquisition" rating in each of our four technology categories:

CATEGORY	#1 SOLUTION
Network security	Next-generation firewall (NGFW)
Endpoint security	Deception technology/honeypot
Application & data security	Bot management
Security management & operations	Advanced security analytics

RESEARCH SPONSORS

PLATINUM	GOLD	SILVER

Copyright © 2024, CyberEdge Group, LLC. All rights reserved. Version 1.0.

Κυβερνοασφάλεια ενόψει NIS 2*



EU IT investments: INFOSEC represents 9% (2023) from 1.9% (2022).

EU IT spending: Median rose to 15M€/organization (2023). INFOSEC spending doubled from 0.7M€ (2022) to 1.4M€ (2024).

IT Full Time Equivalents (FTE): For INFOSEC, it declined from 11.9% (2022) to 11.1% (2023).

CyberSec Workforce: 32% of organisations (59% of SME) struggle to fill CyberSec roles, particularly those requiring technical expertise. 89% expect to need additional CyberSec staff.

NIS 2 Cybersecurity budgets: Organisations anticipate a one-off or permanent increase in CyberSec budgets (NIS 2). SME (34%) cannot afford it.

Cyberattacks: 90% of entities expect an increase in cyberattacks next year, in terms of volume, costliness or both.

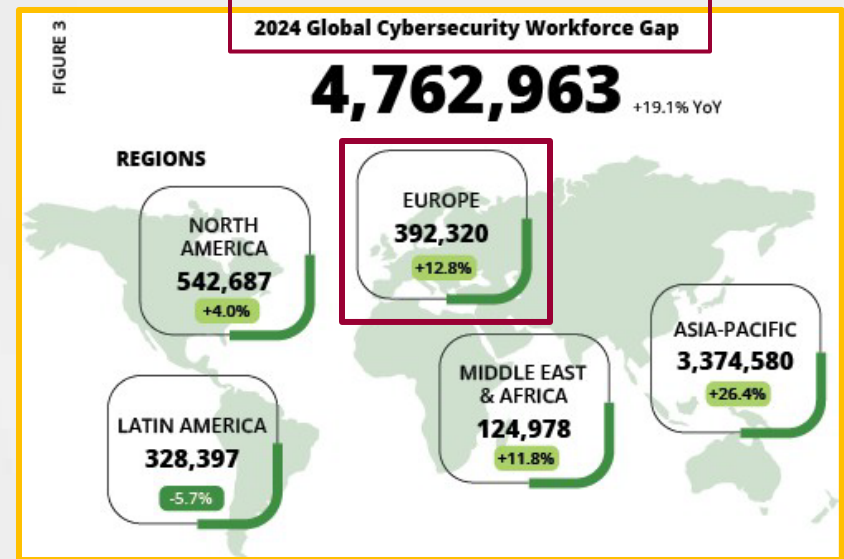
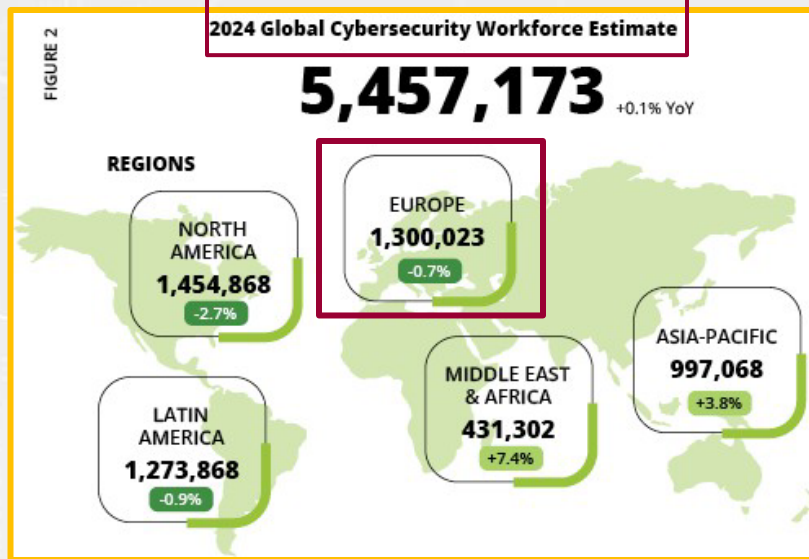
Preparedness: 74% of entities focus their CyberSec preparedness efforts internally, with much lower participation in national or EU-level initiatives.

Awareness: 92% of entities in-scope are aware of NIS 2 basics. Several entities in certain new NIS 2 sectors are not aware.

* NIS Investments - Cybersecurity Policy Assessment, EU Agency for Cybersecurity (ENISA), November 2024.

Κυβερνοασφάλεια

Συνεργασθείτε με Ειδικούς* (;;;)



“... in 2022, the **shortage of cybersecurity professionals** in the European Union ranged between **260,000** and **500,000**, while the EU’s **cybersecurity workforce needs** were estimated at **883,000** professionals ...” **

- * Global Cybersecurity Workforce Prepares for an AI-Driven World, Cybersecurity Workforce Study, ISC², 2024.
- * (ISC)² in Assessing Cyber Skills on the basis of the ECSF, ENISA webinar, Feb 2023.
- ** European Cyber Security Organization (ECSO), Joint Communication to the European Parliament and the Council, EU Policy on Cyber Defense, JOIN(2022) 49 final.



Κυβερνοασφάλεια (& Τεχνητή Νοημοσύνη)

ISC2

Οι τεχνολογικές “αιχμές του δόρατος” σε συνέργεια*

Cybersecurity teams **do not have** sufficient **numbers** or the right **range of skills** to meet their goals.

Pathways to enter the cybersecurity workforce are **changing**, as are their **priorities**.

Diverse backgrounds can help solve the talent gap.

The expected **advancements of AI** will change the way cyber respondents view their **skills shortage**.

Cyber professionals confident Gen AI will **not replace** their role.

Gen AI presents **benefits** and **challenges** for cybersecurity.

Organizations need a **Generative AI** strategy** to responsibly implement the technology.

* *Global Cybersecurity Workforce Prepares for an AI-Driven World, Cybersecurity Workforce Study, ISC2, 2024.*

** Gen AI (Generative AI ή Παραγωγική ΤΝ) είναι είδος Τεχνητής Νοημοσύνης ικανό να παράγει κείμενο, εικόνες, βίντεο κλπ. μέσω παραγωγικών μοντέλων, συχνά ως απάντηση σε ερωτήματα (prompts).



CyberHubs Project:

Ευρωπαϊκή πρωτοβουλία για την Κυβερνοασφάλεια

CyberHubs (3ετές project):

Αποσκοπεί στην αντιμετώπιση της έλλειψης επαγγελματιών Κυβερνοασφάλειας στην ΕΕ. Στόχος είναι η ανάπτυξη ενός αποδοτικού και συνεργατικού ευρωπαϊκού δικτύου που θα ενισχύσει τις δεξιότητες των επαγγελματιών αυτών.

Ανάλυση αναγκών

Συλλογή δεδομένων σε αριθμούς (2024)

7 χώρες (Βέλγιο, Εσθονία, Ελλάδα, Ισπανία, Λιθουανία, Σλοβενία, Ουγγαρία)

193 μελέτες αναλύθηκαν

2.612 θέσεις εργασίας μελετήθηκαν

616 απαντήσεις σε ερωτηματολόγια

147 προγράμματα εκπαίδευσης

120 συναντήσεις εμπειρογνομώνων

Ανάλυση πολλαπλών μεθόδων

1. Έρευνα τεκμηρίωσης (ζήτηση + προσφορά)
2. Ανάλυση κενών θέσεων εργασίας
3. Έρευνα μέσω ερωτηματολογίου
4. Ομάδες εστίασης εμπειρογνομώνων

7 εθνικές μελέτες και η σύνοψη τους διαθέσιμα στο cyberhubs.eu



Αποτελέσματα της ανάλυσης αναγκών

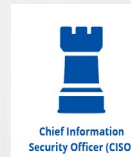
Κυρίαρχοι ρόλοι και δεξιότητες



 Cybersecurity skills	 IT-related skills	 Organisation-related skills	 Transversal (soft) skills
<ul style="list-style-type: none">• Cloud Security• Information Systems & Network Security/Cyber Resiliency• Data Privacy• Threat Analysis• Incident Management	<ul style="list-style-type: none">• System Administration & Integration• Network Management• Enterprise Architecture & Infrastructure Design• Operating Systems	<ul style="list-style-type: none">• Strategic Planning• Risk Management• Business Continuity• Process Control	<ul style="list-style-type: none">• Problem-solving• Acting Responsibly• Communication• Ethical Behaviour

Οι πιο απαραίτητοι ρόλοι

Chief Information Security Officer (CISO)
Cybersecurity Implementer
Cyber Incident Responder




Ανάγκη για εξειδικευμένους (πιο τεχνικούς ρόλους) επαγγελματίες για την καταπολέμηση των εξελιγμένων απειλών.

Επαγγελματίες για υποστήριξη της συμμόρφωσης με Κανονισμούς (πχ. NIS2).

Ελλάδα: Σπουδές στην Κυβερνοασφάλεια

Προγράμματα Εκπαίδευσης & Κατάρτισης*

Ελλάδα: Εκπαίδευση & Κατάρτιση στην Κυβερνοασφάλεια (EQF6 – EQF8)

	2021			2022			2023			2021-23			
	M	W	M+W	M	W	M+W	M	W	M+W	M	W	M+W	
FORMAL EDUCATION SYSTEM													
UNIVERSITIES	157	41	198	143	43	186	156	44	200	456	128	584	
Undergraduate Programmes (EQF 6)	-	-	-	-	-	-	-	-	-	0	0	0	
Postgraduate Programmes (EQF 7)	149	38	187	138	42	180	145	41	186	432	121	553	
Ph.Ds (EQF 8)	8	3	11	5	1	6	11	3	14	24	7	31	
NON-FORMAL EDUCATIONAL SYSTEM & TRAINING													
COLLEGES	19	6	25	27	9	36	43	6	49	89	21	110	
Undergraduate Programmes (EQF 6)	6	0	6	9	2	11	24	1	25	39	3	42	
Postgraduate Programmes (EQF 7)	13	6	19	18	7	25	19	5	24	50	18	68	
Centres of Training and Lifelong Learning (ΚΕΔΙΒΙΜ)	16	17	33	25	22	47	52	30	82	93	69	162	
TOTAL (Education, Training)	173	58	231	171	65	236	218	74	292	638	218	856	
PROFESSIONAL CERTIFICATIONS	ISC: 290 and ISACA: 190 (02/2024)										No gender-related data kept		480
TOTAL (Education, Training, Certification)												1.336	

* Network of European Cybersecurity Skills (CyberHubs), "Cybersecurity skills mismatches analysis (Greece)", Erasmus+, Project 101140030, European Commission, Federation of Hellenic ICT Enterprises & Athens Univ. of Economics & Business, Oct 2024.



Ελλάδα - Δεξιότητες Κυβερνοασφάλειας (2024-30)*

CyberHubs

Co-funded by
the European Union



CyberHub Greece		GREECE: Demand for cybersecurity professionals in the future Qualitative attributes	
Cybersecurity roles in the future	Roles in 2 years (highest first)	Demand for Cybersecurity skills	A lot or substantial need (highest first)
	Cybersecurity Implementer		Data Privacy
	Cyber Incident Responder		Information Systems & Network Security / Cyber Resiliency
	Cybersecurity Risk Manager		Incident Management
	Penetration Tester		Access Controls / Identity Management
	Cybersecurity Architect		Threat Analysis
	Roles after >5 years (highest first)		No need or a limited need (lowest first)
	Cyber Incident Responder		Supply Chain Security
	Cybersecurity Implementer		Operational Technology Security
	Penetration Tester		Digital Forensics
	Cybersecurity Risk Manager		Intelligence Analysis
	Cybersecurity Researcher		AI Security
Other skills (a lot or substantial need) (highest first)			
IT related skills	Organisational skills	Soft skills	Hiring qualifications
Operating Systems	Risk Management	Analytical thinking	Formal certification relevant for the role
Network Management	Education & Training	Creative thinking	Formal professional education relevant for the role
Data Analysis	Process Control	Act responsibly	Bachelor/Master's degree relevant for the role
Enterprise Architecture & Infrastructure Design	Business Continuity	Problem solving	Certificates relevant for the role
System Administration & Integration	Strategic Planning	Planning and organizing	Formal professional education in any field

* Network of European Cybersecurity Skills (CyberHubs), "Cybersecurity skills mismatches analysis (Greece)", Erasmus+, Project 101140030, European Commission, Federation of Hellenic ICT Enterprises & Athens Univ. of Economics & Business, Oct 2024.

Κυβερνοασφάλεια

Αναμνήσεις από το ...μέλλον!



Στο ψηφιακό αύριο θα υπάρχουν
δύο κατηγορίες Οργανισμών:

**Όσοι θα έχουν υποστεί
κυβερνοεπιθέσεις**

και

**όσοι δεν θα γνωρίζουν
ότι έχουν υποστεί κυβερνοεπιθέσεις**

Στο ψηφιακό αύριο θα υπερέχει
μία κατηγορία Οργανισμών:

**Όσοι δεν θα διαθέτουν
επαρκή στελέχη Κυβερνοασφάλειας**

