

// CYBERSECURITY LEARNING • PWA • OFFLINE-READY

NULL//SEC

TRAIN • SOLVE • CERTIFY

Designing a security academy that teaches by doing — 50 courses, hands-on sandbox ranges and an AI companion called NULL — for people who learn better from a live log than from a slide.



```
$ boot null-sec
courses ..... 50 LOADED
sandbox ranges ..... 8 ONLINE
AI companion ..... NULL READY
operator status ..... UNTRAINED
> let's fix that. █
```

ROLE	TEAM	PLATFORM	PRICE
Product · UX/UI · Front-end	Solo	PWA · browser, offline	Free

// 01 — OVERVIEW

SECURITY IS A SKILL. TRAIN IT LIKE ONE.

Beginners meet cybersecurity as theory: acronyms, port numbers, slide decks. Then they freeze in front of their first real log file. The gap isn't knowledge — it's practice.

NULL//SEC is a self-paced academy that runs in the browser and keeps working offline. Every course is broken into short levels, every concept has a sandbox range to try it in, and NULL — a deadpan AI companion — explains, quizzes and hints without giving the answer away.

I designed the curriculum architecture, the operator-console interface, the progression system and the AI companion's behaviour, and built it as a PWA.

THE CHALLENGE

Make a huge, intimidating field navigable for beginners while keeping it credible for people who already work in IT.

THE ANSWER

A course map with clear paths, simulation ranges that mirror real analyst tasks, an operator rank system and exportable certificates.

TIMELINE

2026

AUDIENCE

Beginners → juniors

STACK

PWA · AI companion

LANGUAGE

English

50

Courses from fundamentals to career lab

500+

Short levels — one idea at a time

8

Sandbox ranges for hands-on practice

0 €

Free, in the browser, offline-ready

// 02 — PROBLEM SPACE

TOO MUCH TO LEARN, NOWHERE TO PRACTISE.

Proto-personas based on the brief and common paths into security — hypotheses to validate, not research findings.

V**Vega, 22**

IT student · wants a SOC analyst job

"I know what SQL injection is. I've never seen one."

GOALS

- Hands-on practice without setting up a lab
- Something to show recruiters

FRUSTRATIONS

- Video courses with no exercises
- Labs that need VMs and hours of setup

S**Sónia, 38**

Web developer · wants to code securely

"I need the parts that matter for my job, fast."

GOALS

- OWASP, auth, API and session security
- Learn in 10-minute gaps

FRUSTRATIONS

- Courses start from zero every time
- No way to skip what she knows

Overwhelm

Fifty topics with no visible path.
Beginners can't tell where to start or what depends on what.

Theory gap

Reading about an attack and recognising one in a log are different skills — only practice builds the second.

Motivation decay

Long courses lose people at the first hard concept. Progress has to be felt every few minutes.

How might we turn a beginner into an operator by letting them **solve real-looking incidents** from the very first hour?

// 03 — PRINCIPLES & DECISIONS

BUILT LIKE A CONSOLE, PACED LIKE A GAME.

01

Learn → do, every level

No concept ships without a task that uses it — a log to read, a packet to trace, a cipher to break.

02

Small levels

Each course splits into roughly ten levels sized for a short session.

03

Hint, don't tell

NULL nudges toward the answer; the user still makes the discovery.

04

Diegetic UI

Terminals, LEDs and range tags make the interface itself part of the training.

05

Proof of skill

Certificates at 100% give learners something tangible to share.

CONSTRAINT

Offline-first

A PWA that works without a connection — on a train, in a classroom.

// DECISION LOG

Curriculum

DECISION

50 courses grouped into tracks, with "hot" topics flagged on the map.

WHY

A visible map answers "where do I start?" and lets experts jump ahead.

Ranges

DECISION

8 reusable simulation formats instead of bespoke labs per course.

WHY

Learners master a format once, then focus on content — and it scales to 500+ levels.

Companion

DECISION

An AI character with three fixed actions: Explain, Quiz me, Hint.

WHY

Bounded actions keep answers on-topic and stop it solving tasks outright.

Progress

DECISION

XP, day streaks, achievements and operator ranks.

WHY

Short loops of reward carry learners past the first hard topic.

Tone

DECISION

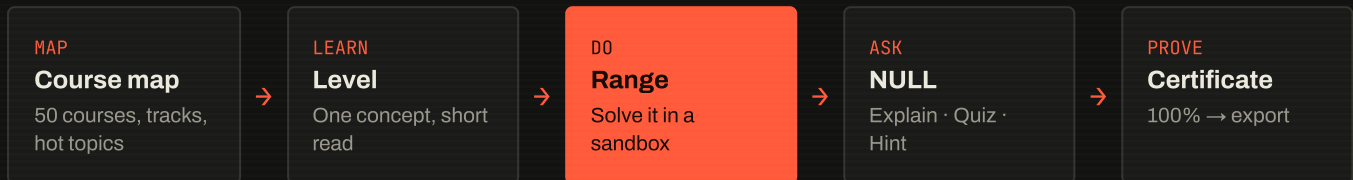
Dark graphite, warm orange, acid-lime success — no neon-green cliché.

WHY

Feels like a professional tool, not a hacker movie.

// 04 — EXPERIENCE ARCHITECTURE

FROM THE MAP TO A CERTIFICATE.



// COURSE MAP · EXCERPT

01 Cybersecurity Fundamentals	02 Networking Fundamentals
03 TCP/IP	04 DNS
05 HTTP & HTTPS	06 Linux Security
07 Cryptography Fundamentals	08 Authentication
09 OWASP Web Security	10 SQL Injection
11 Cross-Site Scripting	12 API Security
13 Cloud Security	14 Container Security
15 SIEM Fundamentals	16 Log Analysis
17 Incident Response	18 Digital Forensics
19 Malware Analysis	20 Threat Intelligence
21 Zero Trust	22 Penetration Testing
23 Privacy & Data Protection	24 Capture The Flag

24 of 50 shown · orange = hot topic

// THE 8 SANDBOX RANGES

LOG HUNT	PACKET TRACE	AUTH ANOMALY
CODE AUDIT	CIPHER LAB	SEQUENCE
PHISH SPOTTER	CLASSIFY	

Each range is a reusable interaction pattern. A packet trace in "DNS" and in "Network Security" works the same way, so the learner's attention goes to the security idea, not the controls.

WHY FORMATS, NOT LABS

Eight formats cover reading evidence, spotting anomalies, auditing code and ordering steps — the core verbs of an analyst's day — and let 500+ levels share one polished UI.

// 05 — KEY SCREENS

FIND THE MOMENT THEY GOT IN.

RANGE 01 · LOG HUNT · SANDBOX

1

Read the authentication log. Find the moment the attacker got in.

03:12:41	4624	Logon success · user=j.silva · src=10.0.4.23
03:13:58	4625	Logon failure · user=admin · src=203.0.113.47
03:14:02	4625	Logon failure · user=admin · src=203.0.113.47
03:14:09	4625	Logon failure · user=admin · src=203.0.113.47
03:14:21	4624	Logon success · user=admin · src=203.0.113.47
03:15:02	4672	Special privileges assigned · user=admin

2

3

4

THREAT FOUND

Brute force succeeded at 03:14:21 from 203.0.113.47

+120 XP

1 One question

Every range opens with a single plain-language task, so the learner knows what "done" looks like.

2 Real-looking evidence

Event IDs, timestamps and sources follow real Windows log conventions, with reserved example IPs.

3 The pattern emerges

Repeated failures from one source are tinted amber — visible on a second look, not on the first.

4 Verdict and reward

The answer is confirmed in acid-line with a one-line explanation and XP.

ASK NULL · AI COMPANION

Why does 4625 → 4624 from the same IP matter?

A run of **failed logons (4625)** followed by a **success (4624)** from one external IP is the classic brute-force signature: the attacker guessed until a password worked. Next, check **4672** — admin rights were assigned.

EXPLAIN

QUIZ ME

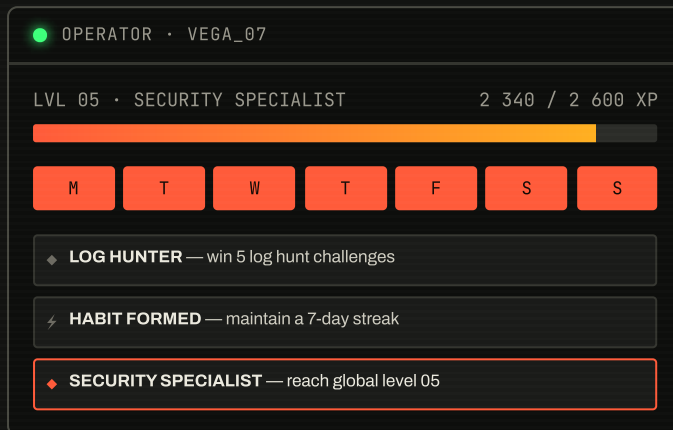
HINT

César Martins Lima · UI/UX · Subversive Symmetry

06 / 11

// 06 — DEEP DIVE • PROGRESSION & NULL

OPERATOR STATUS: NO LONGER UNTRAINED.



RANKS

Untrained → Analyst
→ Security Specialist
and beyond — a
career metaphor, not
a score.

STREAKS

Seven squares, one
per day. Small,
honest, motivating.

NULL, the companion

NULL is a character, not a chatbot window. A bone-white face with an orange mouth, it appears beside the task it's helping with and speaks in short, dry sentences.

EXPLAIN

Unpacks the
concept behind
the current level.

QUIZ ME

Generates a quick
check to lock it in.

HINT

Points at where to
look — never the
answer.

Stays on security
topics and the
user's current
range.



> "Four failures, one success,
same IP. You tell me."

// 07 — DEEP DIVE • PROOF OF SKILL

SOMETHING TO SHOW FOR THE WORK.

NULL//SEC • CERTIFICATE OF COMPLETION

INCIDENT RESPONSE

Awarded to **VEGA_07** for completing all levels and ranges of the course.

LEVELS	RANGES	DATE
10/10	3/3	2026

A Subversive Symmetry project



Certificates turn private progress into public proof. They unlock only at 100% — every level and every range — so they mean something.

Designed to be shared

A light "paper" layout contrasts with the dark app, prints cleanly and reads well as an image on LinkedIn or in a portfolio.

The finish line is visible

Each course card shows its completion percentage, so learners can see how close the next certificate is.

EXPORT PDF

EXPORT PNG

SHARE

// MOTION & SOUND

GLITCH CUTS

Short glitches mark scene and state changes; reduced-motion settings disable them.

LEDs & SCANLINES

Status lights and faint scanlines make "online" and "solved" readable at a glance.

AUDIO CUES

Subtle synthesised ticks for typing, a rising tone for a solved range.

// 08 — DESIGN SYSTEM

GRAPHITE, EMBER AND ACID.

A warm graphite base avoids the cold, clichéd "hacker green". Ember orange marks action and danger; acid lime is reserved for success and the current target.

Background #121311 · #0d0e0c	Ember #ff5b3a	Acid #d4ff3a	Text / bone #ebe9de · #cfcfdc1

SIGNALS

DISPLAY
ARCHIVO EXPANDED 900

TRAIN-SOLVE

BODY
ARCHIVO 400

Read the authentication log. Find the moment the attacker got in.

CONSOLE
JETBRAINS MONO

03:14:21 · 4624 · THREAT FOUND

ACTIONS EXPLAIN QUIZ ME HINT	TAGS SANDBOX RANGE 01 HOT	SIGNATURE Corner brackets frame every panel — a targeting reticle that ties the UI to the subject.
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// 09 — OUTCOME & LEARNINGS

WHAT SHIPPED, AND WHAT COMES NEXT.

ETHICS BY DESIGN

- All offensive topics taught defensively and in sandboxes only
- Example data uses reserved IP ranges and fictional users
- NULL refuses off-scope or harmful requests
- Free access — no paywall on fundamentals

ACCESSIBILITY

- State never relies on colour alone — tags carry words
- Monospace evidence at readable sizes on mobile
- Reduced-motion disables glitches and scanline motion
- Offline PWA for low-connectivity classrooms

What worked

Reusable range formats. Designing eight interactions well gave far better quality than 50 one-off labs could have.

What I'd change

Add a placement quiz on day one, so experienced users like Sónia skip straight to the tracks they need.

Hardest call

Keeping NULL helpful but not too helpful — a hint system that teaches instead of solving.

Metrics to track next

L1→L3

Drop-off across the first three levels of a course

Hint use

Hints per solved range, by format

Streak 7

Share of learners reaching a 7-day streak

Certs

Certificates exported per active learner

NULL//SEC

TRAIN • SOLVE • CERTIFY

FREE. OFFLINE-READY. IN YOUR BROWSER.

Thanks for reading. NULL//SEC is a Subversive Symmetry project.

PRODUCT

null-sec.info

DESIGNER

clima-portfolio.net

STUDIO

subversive-symmetry.com

Design & build: César Martins Lima • Powered by Subversive Symmetry • Operator names, logs and XP shown are examples.