NVD CVE API :

Overview :

The NVD CVE Dashboard is a web application that fetches CVE data from the official NVD API
, stores it in a relational database, and provides a user-friendly interface for exploring vulnerabilities.

It allows security researchers and developers to:

Synchronize CVEs from NVD into a structured database.
Query CVEs using filters (year, severity, date, etc.).
Browse vulnerabilities with a smooth web dashboard.
View detailed CVE insights with CVSS scores, impacts, and references.

Tech Stack :

Backend: Python, FastAPI, Psycopg2
Database: PostgreSQL (Neon Cloud)
Frontend: HTML, CSS, JavaScript
Visualization: Chart.js
Deployment: Uvicorn

System Architecture :

Database (PostgreSQL)
Stores CVEs with metadata and raw JSON.
Backend (FastAPI)
Provides REST endpoints for CVE list & detail.
Handles pagination, filtering, and sorting.
Frontend (Vanilla JS + HTML/CSS)
Dashboard to view CVEs.
Detail page with expanded info and graphs.

Features :

Backend -
Fetch CVEs from NVD in batches.
Deduplication using CVE ID.
REST API with filtering & sorting.
Paginated results for scalability.

Frontend -
Dashboard (/)
Paginated CVE list.
Filters: CVE ID, Year, Min Score (V2/V3), Last N days.
Sorting by Published or Last Modified date.
Detail Page (/detail.html)
Basic info (CVE ID, description, dates).
CVSS v2 & v3 scores with severity badges.
Attack vector & impact (Confidentiality, Integrity, Availability).
Vulnerable products.
References.

API Documentation :

1. List CVEs
Endpoint: /cves/list
Method: GET

Query Params :

page (int, default=1)
results_per_page (int, default=10)
sort_by (published_date / last_modified)
sort_order (asc / desc)

year (int)
min_score_v3 (float)
min_score_v2 (float)
last_n_days (int)
cve_id (string, partial match)
Response:


```
{
  "page": 1,
  "results_per_page": 10,
  "total_records": 12345,
  "cves": [
    {
      "cve_id": "CVE-2024-1234",
      "year": 2024,
      "published_date": "2024-05-12T14:30:00",
      "last_modified": "2024-06-01T10:00:00",
      "base_score_v3": 7.8,
      "base_score_v2": 6.5,
      "description": "Buffer overflow in XYZ...",
      "raw_json": {}
    }
  ]
}
```


2. CVE Detail

Endpoint: /cves/{cve_id}
Method: GET

Response:


```
{
  "cve_id": "CVE-2024-1234",
  "description": "Buffer overflow in XYZ...",
```

```
  "published_date": "2024-05-12T14:30:00",
  "last_modified": "2024-06-01T10:00:00",
  "base_score_v3": 7.8,
  "base_score_v2": 6.5,
  "raw_json": {
    "metrics": {
      "cvssMetricV3": [
        {
          "cvssData": {
            "baseScore": 7.8,
            "attackVector": "NETWORK",
            "confidentialityImpact": "HIGH",
            "integrityImpact": "HIGH",
            "availabilityImpact": "HIGH"
          }
        }
      ]
    },
    "references": [
      { "url": "https://vendor.com/security/advisory" }
    ]
  }
}
```


Setup & Deployment :
Prerequisites

Python 3.9+

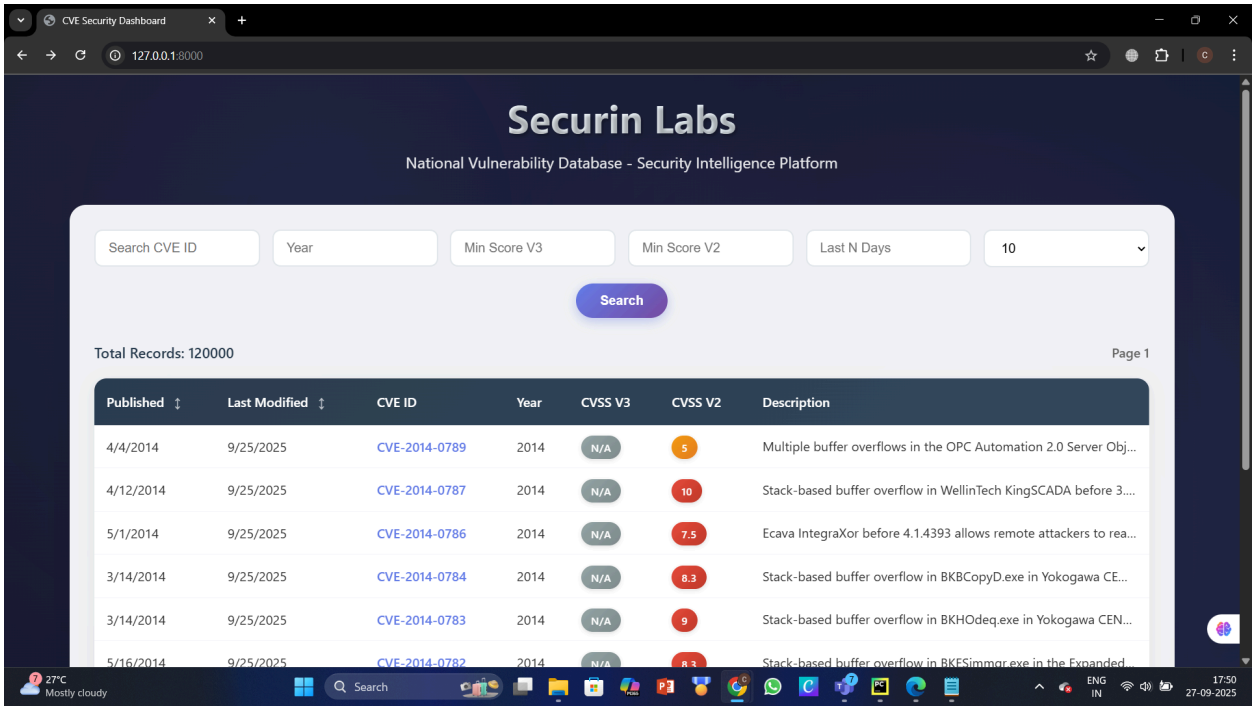
PostgreSQL (or Neon Cloud DB)

Installation

```
# Clone repo
git clone <repo-url>
cd nvd-dashboard
```

Install dependencies
pip install fastapi uvicorn psycopg2-binary
Run Backend
python main.py
Runs at → http://127.0.0.1:8000
Access Frontend
Dashboard: http://127.0.0.1:8000/
Detail Page: http://127.0.0.1:8000/detail.html?cve_id=CVE-2024-1234

Screenshots :


CVE Security Dashboard
127.0.0.1:8000
Securin Labs
National Vulnerability Database - Security Intelligence Platform
Search CVE ID
Year
Min Score V3
Min Score V2
Last N Days
10
Search
Total Records: 120000
Page 1
Published
Last Modified
CVE ID
Year
CVSS V3
CVSS V2
Description
4/4/2014 9/25/2025 CVE-2014-0789 2014 N/A 5 Multiple buffer overflows in the OPC Automation 2.0 Server Obj...
4/12/2014 9/25/2025 CVE-2014-0787 2014 N/A 10 Stack-based buffer overflow in WellinTech KingSCADA before 3....
5/1/2014 9/25/2025 CVE-2014-0786 2014 N/A 7.5 Ecava IntegraXor before 4.1.4393 allows remote attackers to rea...
3/14/2014 9/25/2025 CVE-2014-0784 2014 N/A 8.3 Stack-based buffer overflow in BKBCopyD.exe in Yokogawa CE...
3/14/2014 9/25/2025 CVE-2014-0783 2014 N/A 9 Stack-based buffer overflow in BKHOdeq.exe in Yokogawa CEN...
27°C
Mostly cloudy
Search
ENG
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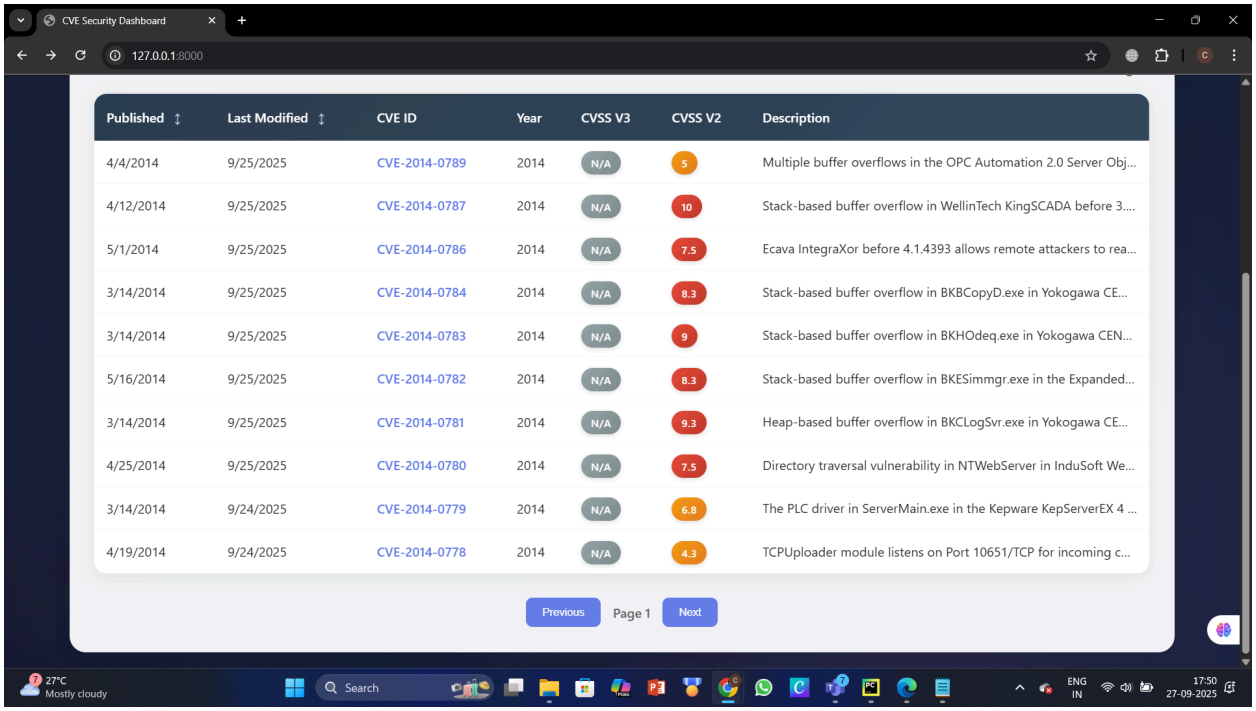
17:50
27-09-2025


CVE Security Dashboard
127.0.0.1:8000
Published
Last Modified
CVE ID
Year
CVSS V3
CVSS V2
Description
4/4/2014 9/25/2025 CVE-2014-0789 2014 N/A 5 Multiple buffer overflows in the OPC Automation 2.0 Server Obj...
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3/14/2014 9/25/2025 CVE-2014-0783 2014 N/A 9 Stack-based buffer overflow in BKHOdeq.exe in Yokogawa CEN...
5/16/2014 9/25/2025 CVE-2014-0782 2014 N/A 8.3 Stack-based buffer overflow in BKESimmgr.exe in the Expanded...
3/14/2014 9/25/2025 CVE-2014-0781 2014 N/A 9.3 Heap-based buffer overflow in BKCLogSvr.exe in Yokogawa CE...
4/25/2014 9/25/2025 CVE-2014-0780 2014 N/A 7.5 Directory traversal vulnerability in NTWebServer in InduSoft We...
3/14/2014 9/24/2025 CVE-2014-0779 2014 N/A 6.8 The PLC driver in ServerMain.exe in the Kepware KepServerEX 4 ...
4/19/2014 9/24/2025 CVE-2014-0778 2014 N/A 4.3 TCPUploader module listens on Port 10651/TCP for incoming c...
Previous
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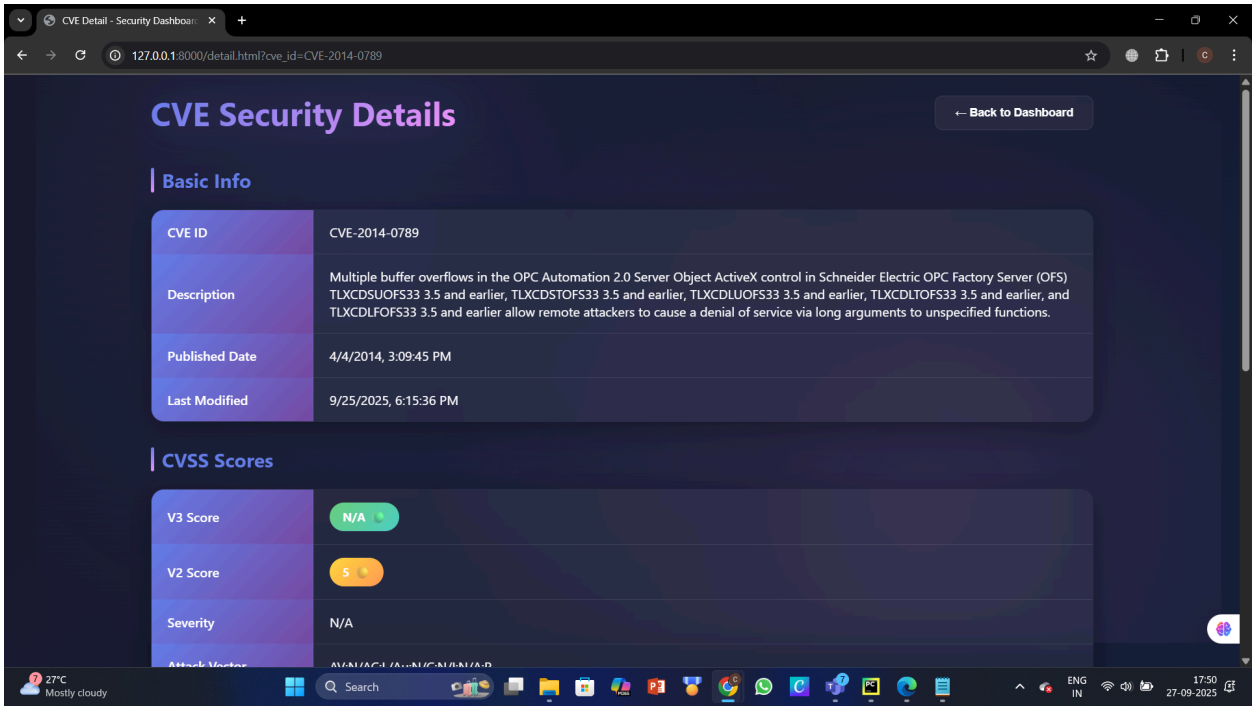
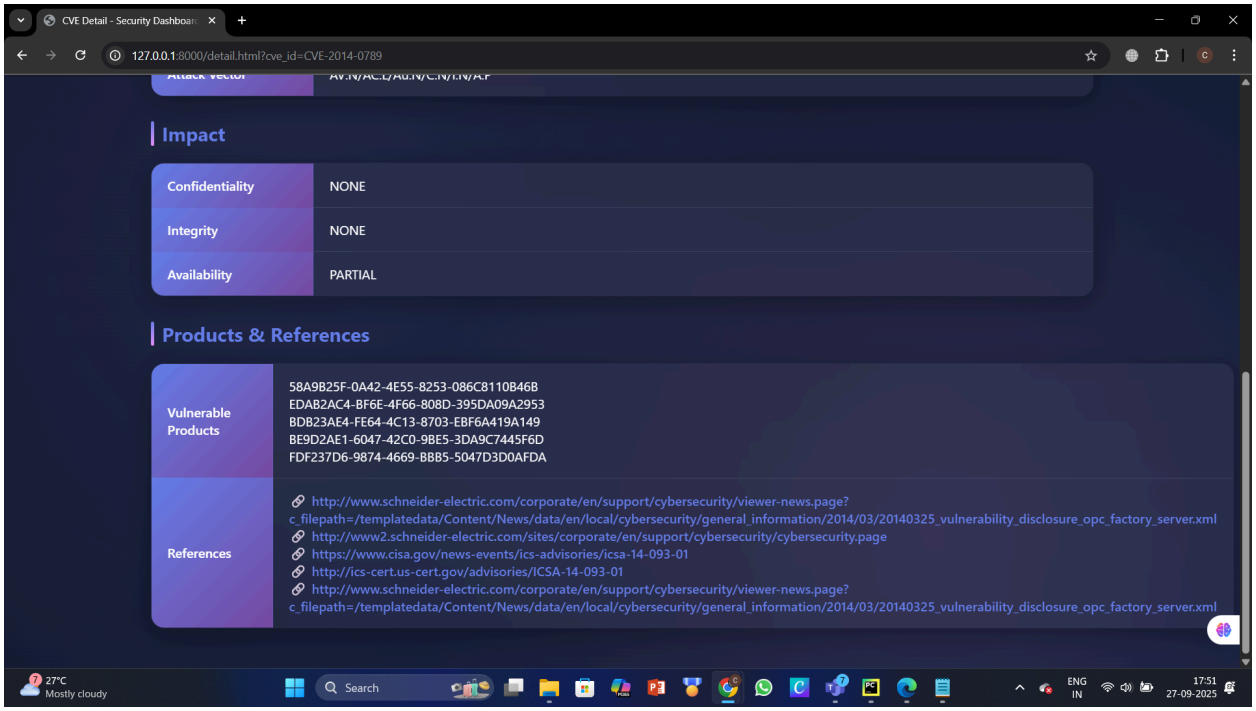
27°C
Mostly cloudy
Search
ENG
IN
17:50
27-09-2025





Evaluation Checklist :

Logical Approach → Data sync, deduplication, filters.
Code Quality → Clean, modular, well-documented.

Input/Output Screenshots → Provided in repo.
API Docs → Included in README.
UI → Simple, clean, responsive.

Future Enhancements :

Incremental sync (instead of full reload).
CSV/PDF export.
Authentication & role-based dashboards.
Advanced graphs for CVE trends.

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