MICHIGAN STATE UNIVERSITY

Alpha Presentation

Packet Forge: AI Network Protocol Engine

The Capstone Experience

Team Vectra AI

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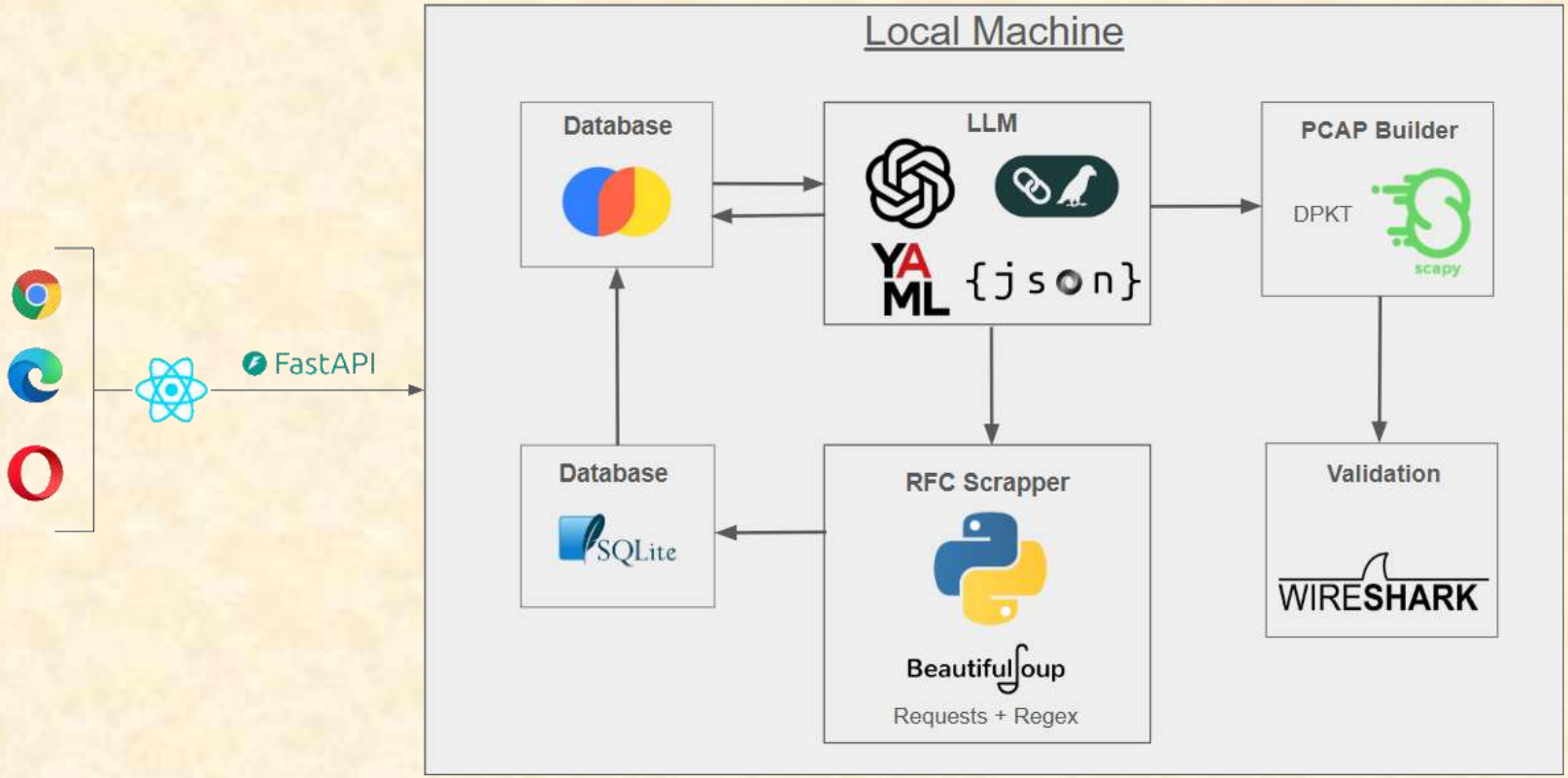
From Students…
…to Professionals

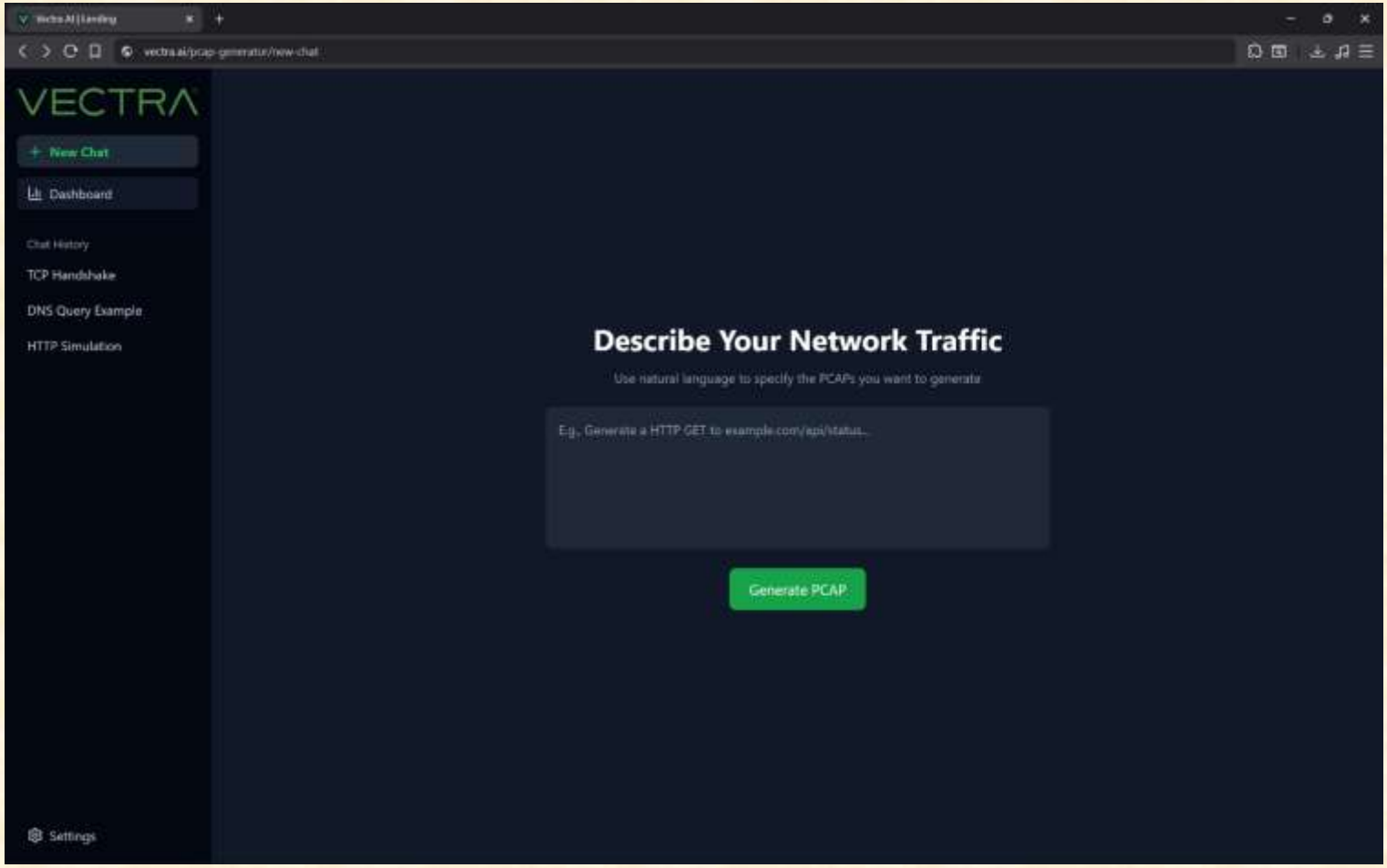
Project Overview

- Vectra AI is the industry leader in preventative cybersecurity AI, relying on vast, high-quality network data to train its detection systems
- A major obstacle is the strenuous and intricate process of creating realistic network traffic for training such models, which is not yet automated
- Packet Forge solves this problem by automating high-quality, AI-driven packet generation

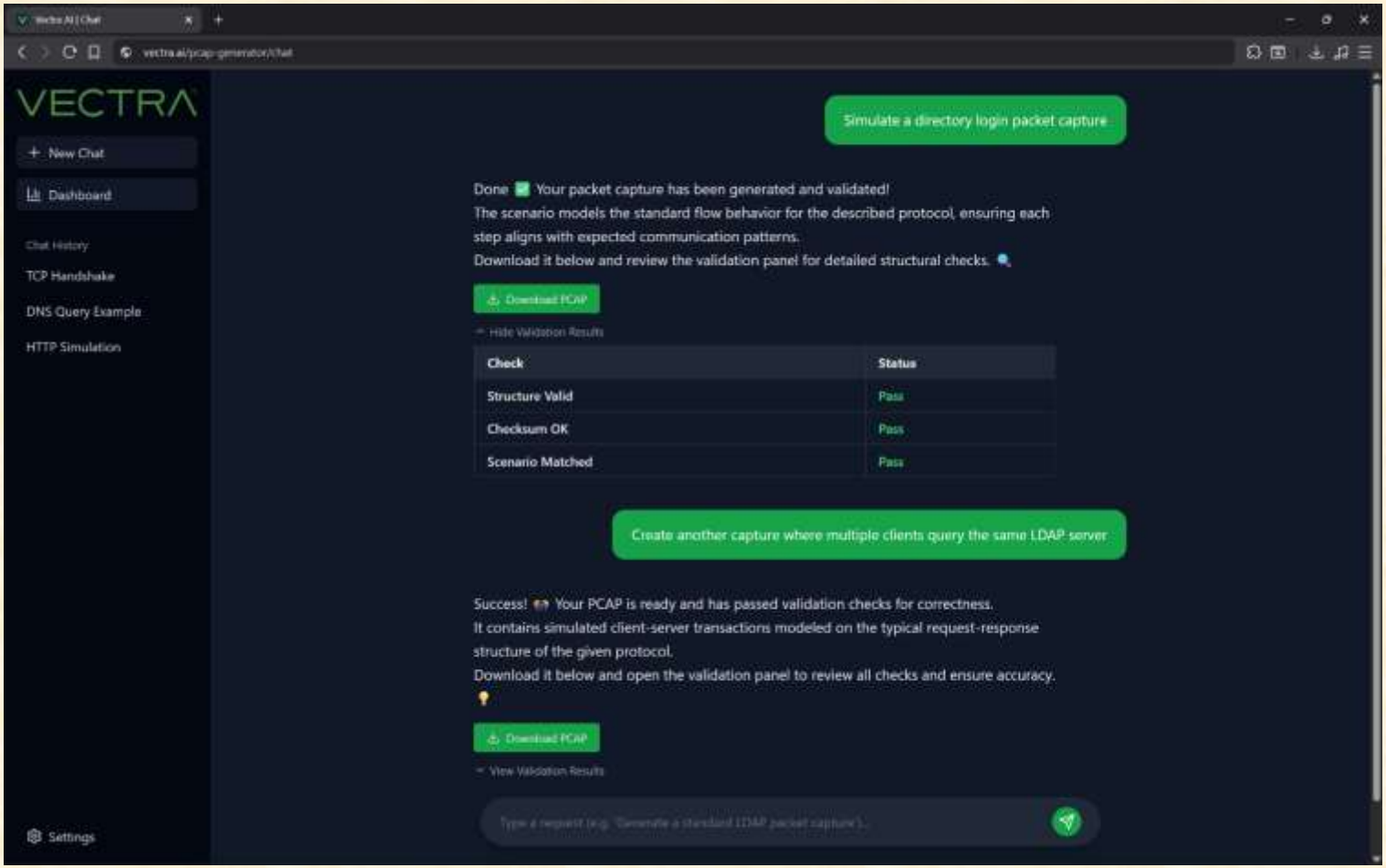
System Architecture



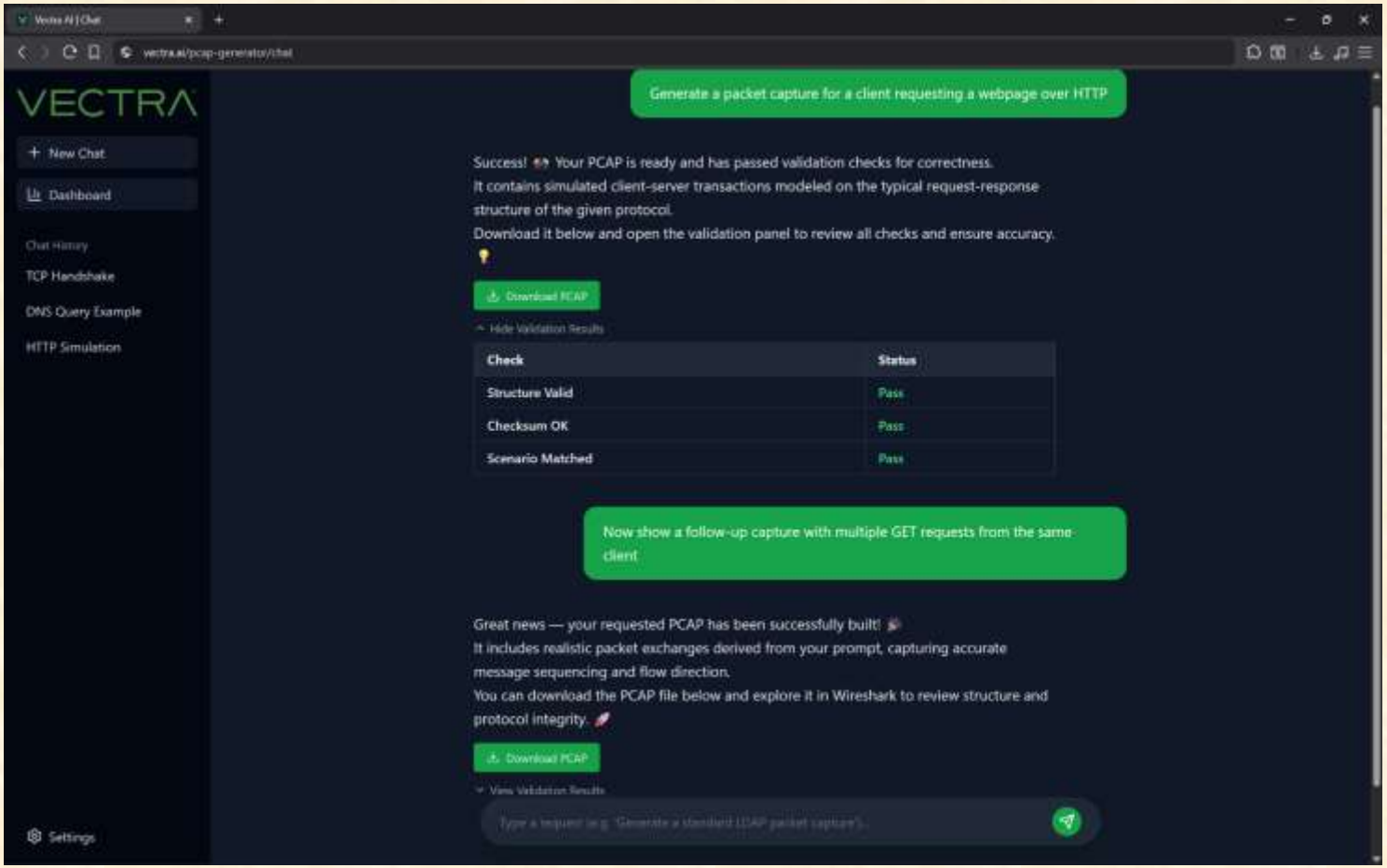
Landing Page



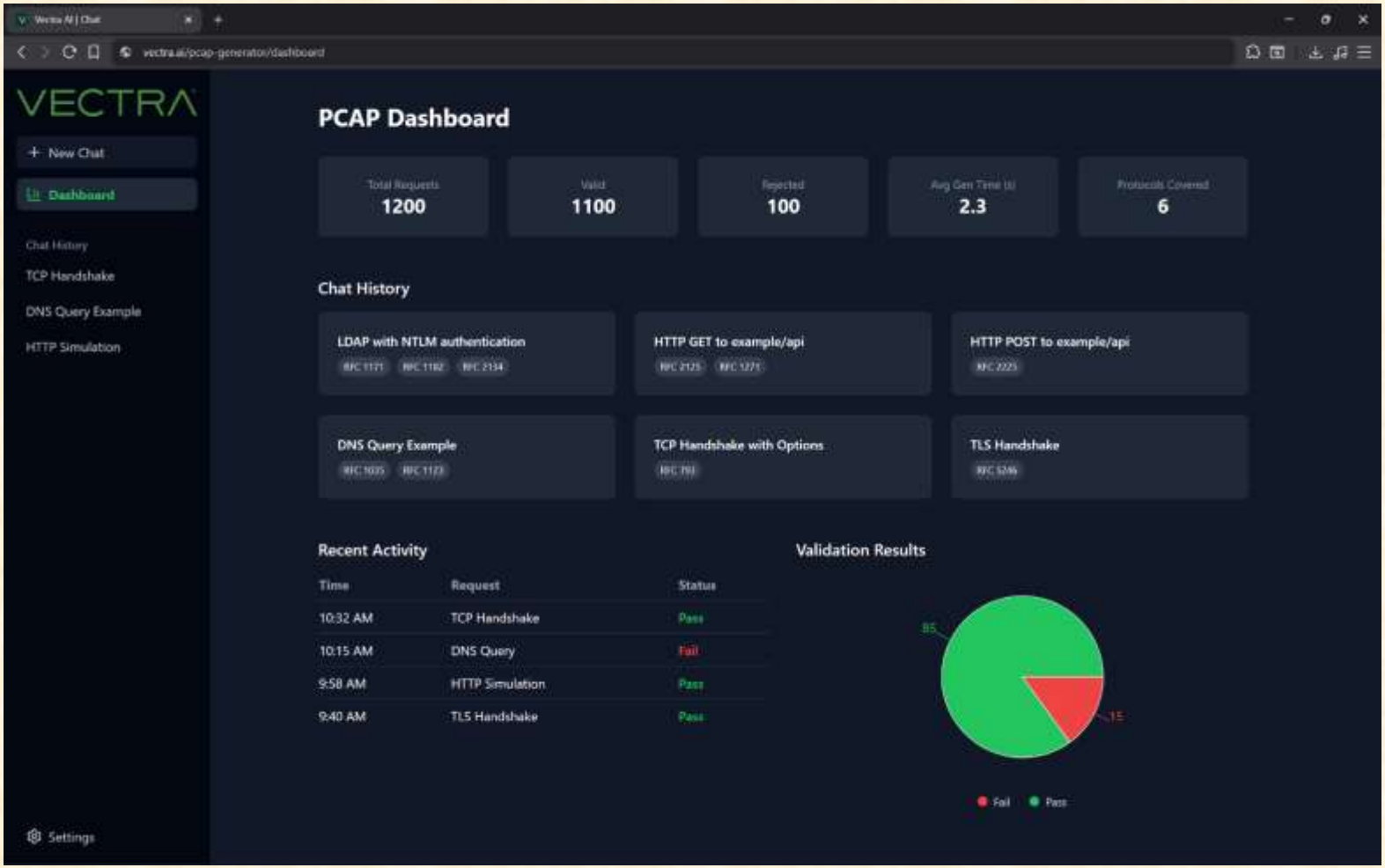
Use Case 1


VECTRA
New Chat
Dashboard
Chat History
TCP Handshake
DNS Query Example
HTTP Simulation
Settings
Simulate a directory login packet capture
Done ✅ Your packet capture has been generated and validated!
The scenario models the standard flow behavior for the described protocol, ensuring each step aligns with expected communication patterns.
Download it below and review the validation panel for detailed structural checks. 🔍
Download PCAP
Hide Validation Results
Check
Status
Structure Valid
Pass
Checksum OK
Pass
Scenario Matched
Pass
Create another capture where multiple clients query the same LDAP server
Success! 🎉 Your PCAP is ready and has passed validation checks for correctness.
It contains simulated client-server transactions modeled on the typical request-response structure of the given protocol.
Download it below and open the validation panel to review all checks and ensure accuracy.
💡
Download PCAP
View Validation Results

Use Case 2


VECTRA
New Chat
Dashboard
Chat History
TCP Handshake
DNS Query Example
HTTP Simulation
Settings
Generate a packet capture for a client requesting a webpage over HTTP
Success! Your PCAP is ready and has passed validation checks for correctness.
It contains simulated client-server transactions modeled on the typical request-response structure of the given protocol.
Download it below and open the validation panel to review all checks and ensure accuracy.
Download PCAP
Hide Validation Results
Check
Status
Structure Valid
Pass
Checksum OK
Pass
Scenario Matched
Pass
Now show a follow-up capture with multiple GET requests from the same client
Great news — your requested PCAP has been successfully built!
It includes realistic packet exchanges derived from your prompt, capturing accurate message sequencing and flow direction.
You can download the PCAP file below and explore it in Wireshark to review structure and protocol integrity.
Download PCAP

Dashboard


VECTRA
New Chat
Dashboard
Chat History
TCP Handshake
DNS Query Example
HTTP Simulation
Settings
PCAP Dashboard
Total Requests
1200
Valid
1100
Rejected
100
Avg Gen Time (s)
2.3
Protocols Covered
6
Chat History
LDAP with NTLM authentication
HTTP GET to example/api
HTTP POST to example/api
DNS Query Example
TCP Handshake with Options
TLS Handshake
Recent Activity
Time
Request
Status
10:32 AM
TCP Handshake
Pass
10:15 AM
DNS Query
Fail
9:58 AM
HTTP Simulation
Pass
9:40 AM
TLS Handshake
Pass
Validation Results
Fail
Pass

What's left to do?

- Make the back-end fully modular and ready for all protocols
- Allow the system automatically learn protocol behavior from RFCs or technical PDFs
- Verify PCAP accuracy using Wireshark and Scapy
- Containerize full system

Questions?