MICHIGAN STATE UNIVERSITY

Beta 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

Team Member's Technical Tasks

Technical Tasks Assigned

- Sean Finkel
  - Programmatic pcap generation
  - LLM pcap generation
  - Creation of fabricated metadata
- Aanshik Upadhyay
  - Database setup and management
  - Frontend work
  - Validation for protocols
- Sam Barnhart
  - RFC scraper
  - Database Visualizer
  - Pcap annotator
- Yeji Lee
  - Orchestrator
  - Self submitted pcap validator
  - Validation rules
- Kaajal Shah
  - Asn1 Encoder
  - Chat history
  - Generate pcap for non ruled protocols
- Nihar Bollareddy
  - Vector Embeddings
  - LLM base functionality
  - ChromaDB

Technical Tasks Completed

- Sean Finkel
  - Programmatic pcap generation
  - LLM pcap generation
  - Creation of fabricated metadata
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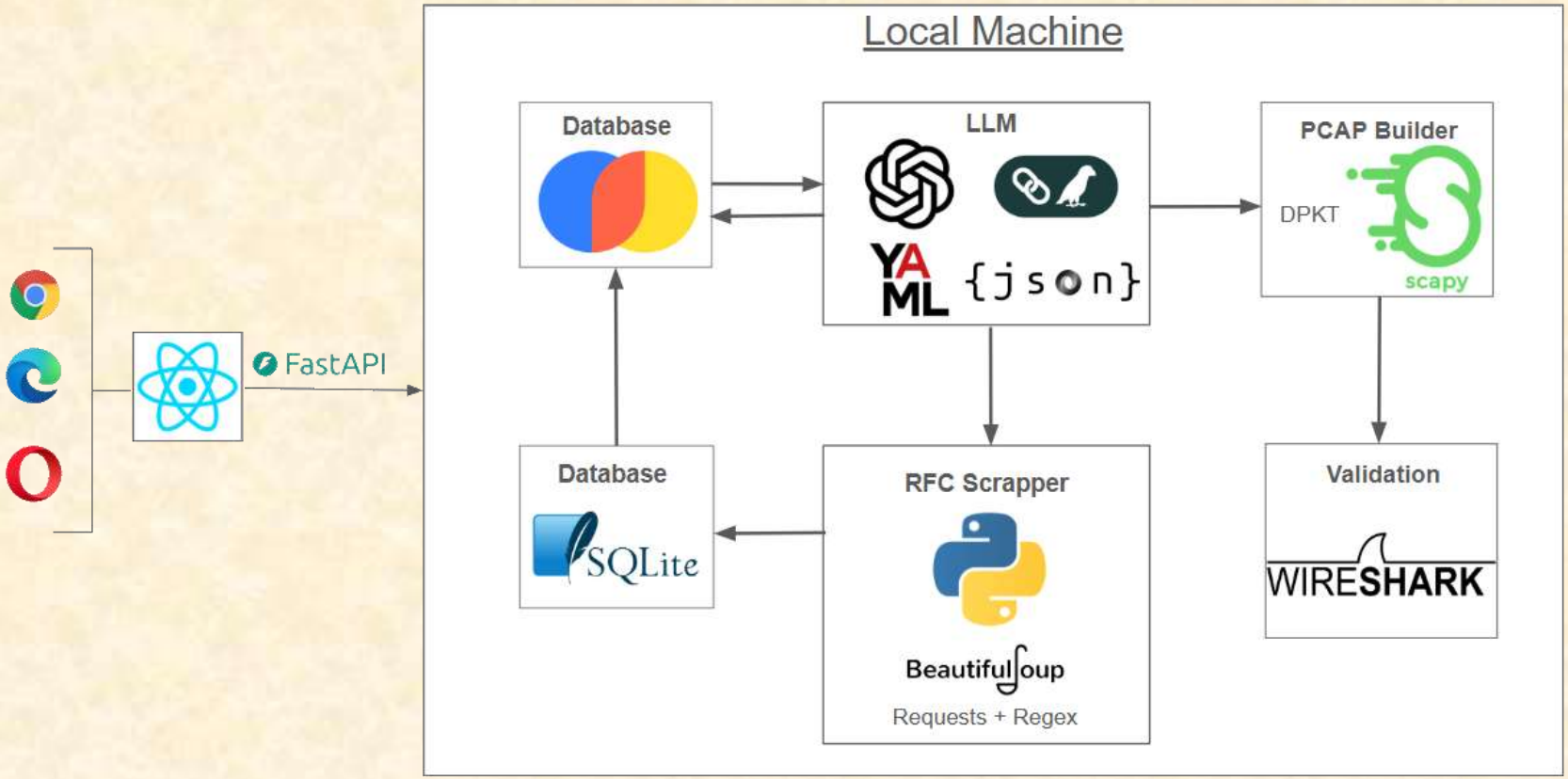
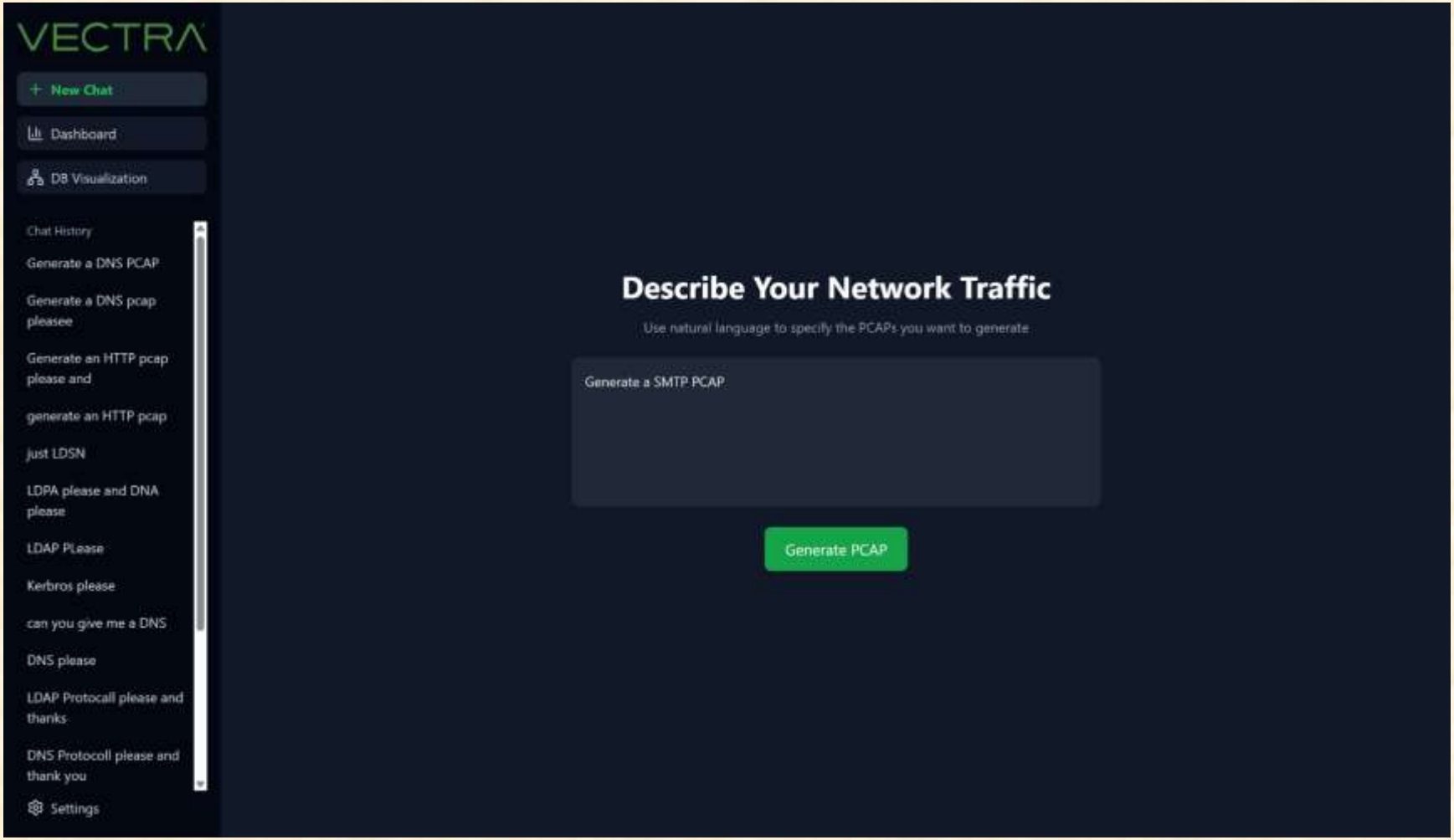
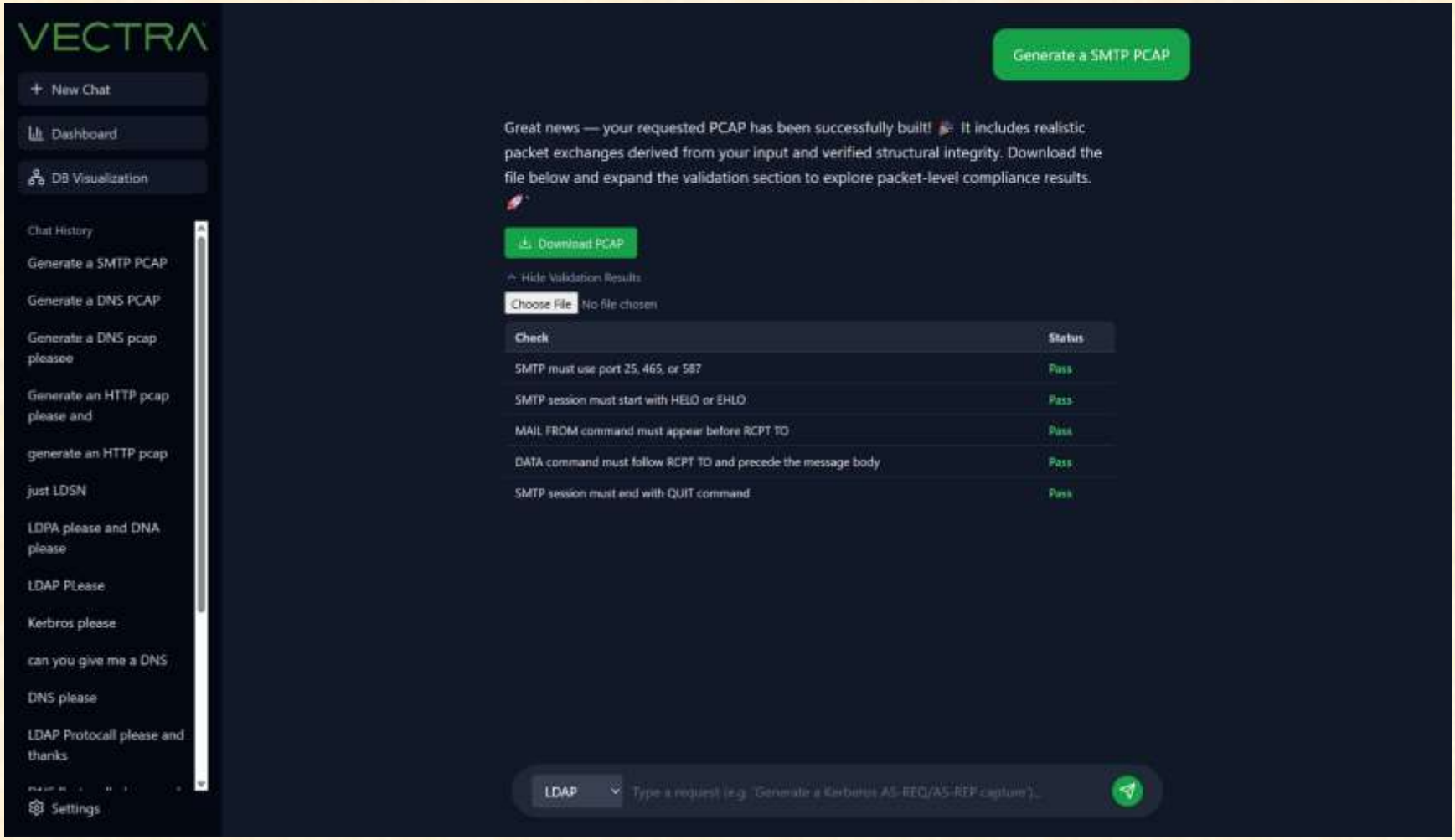
System Architecture



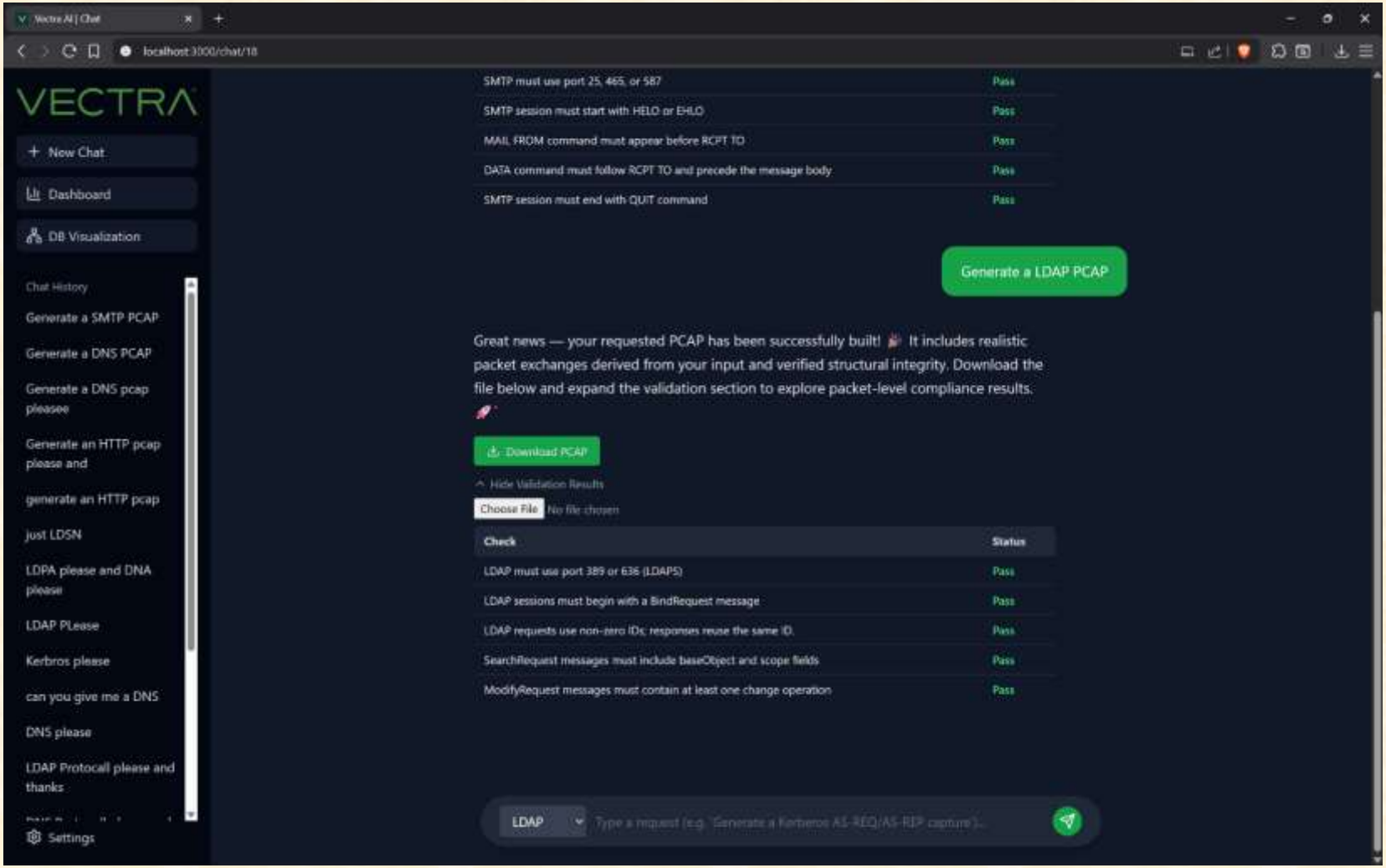
Landing Page



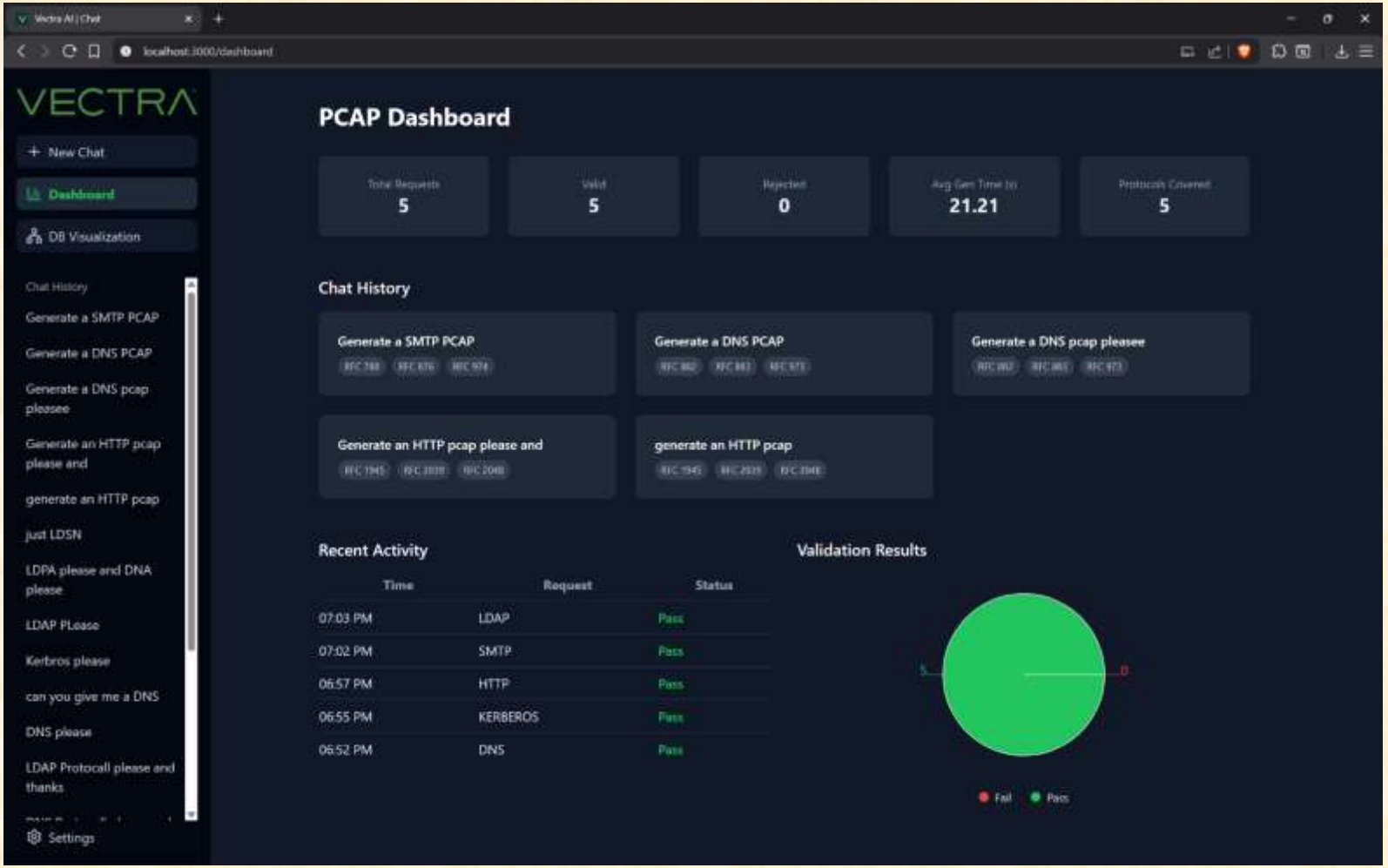
Chat


VECTRA
New Chat
Dashboard
DB Visualization
Chat History
Generate a SMTP PCAP
Generate a DNS PCAP
Generate a DNS pcap pleasee
Generate an HTTP pcap please and
generate an HTTP pcap
just LDSN
LDPA please and DNA please
LDAP PLease
Kerbros please
can you give me a DNS
DNS please
LDAP Protocall please and thanks
Settings
Generate a SMTP PCAP
Great news — your requested PCAP has been successfully built! 🎉 It includes realistic packet exchanges derived from your input and verified structural integrity. Download the file below and expand the validation section to explore packet-level compliance results.
Download PCAP
Hide Validation Results
Choose File
No file chosen
Check
Status
SMTP must use port 25, 465, or 587
Pass
SMTP session must start with HELO or EHLO
Pass
MAIL FROM command must appear before RCPT TO
Pass
DATA command must follow RCPT TO and precede the message body
Pass
SMTP session must end with QUIT command
Pass
LDAP

Pcap validation



Dashboard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Settings
PCAP Dashboard
5
5
0
21.21
5
Chat History
Generate a SMTP PCAP
Generate a DNS PCAP
Generate a DNS pcap pleasee
Generate an HTTP pcap please and
generate an HTTP pcap
Recent Activity
Time
Request
Status
07:03 PM
LDAP
Pass
07:02 PM
SMTP
Pass
06:57 PM
HTTP
Pass
06:55 PM
KERBEROS
Pass
06:52 PM
DNS
Pass
Validation Results
5
0
Fail
Pass

What's left to do?

- Features
- Stretch Goals
- Other Tasks
  - Improve metadata
  - Test with new protocols

Questions?