NLP Cloudy Bot

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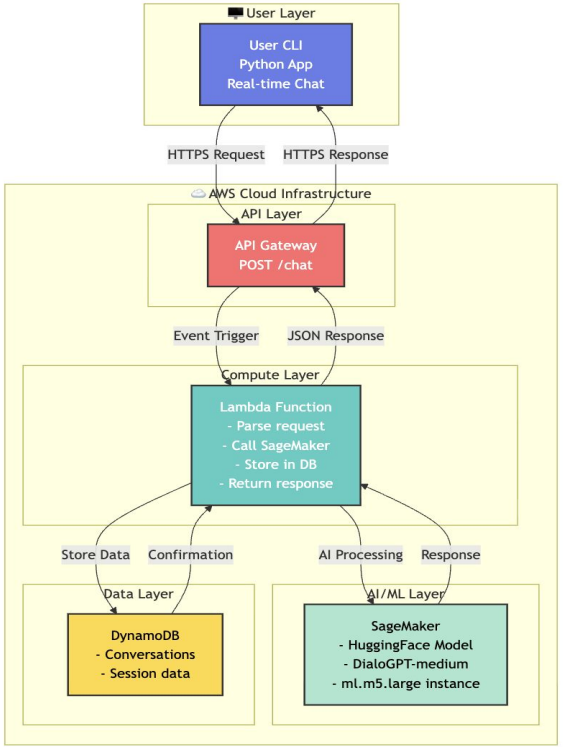
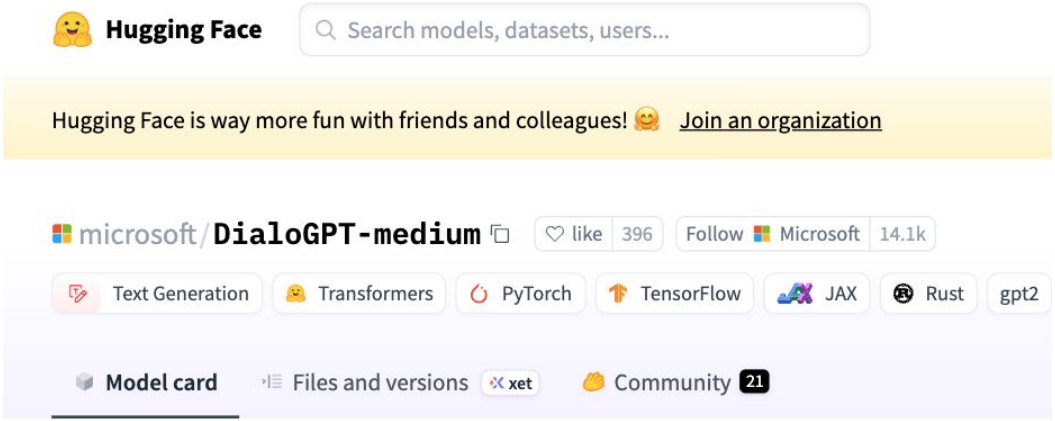
System Architecture Overview

User types in CLI → API Gateway → Lambda processes → SageMaker AI responds → DynamoDB stores history



System Architecture Overview

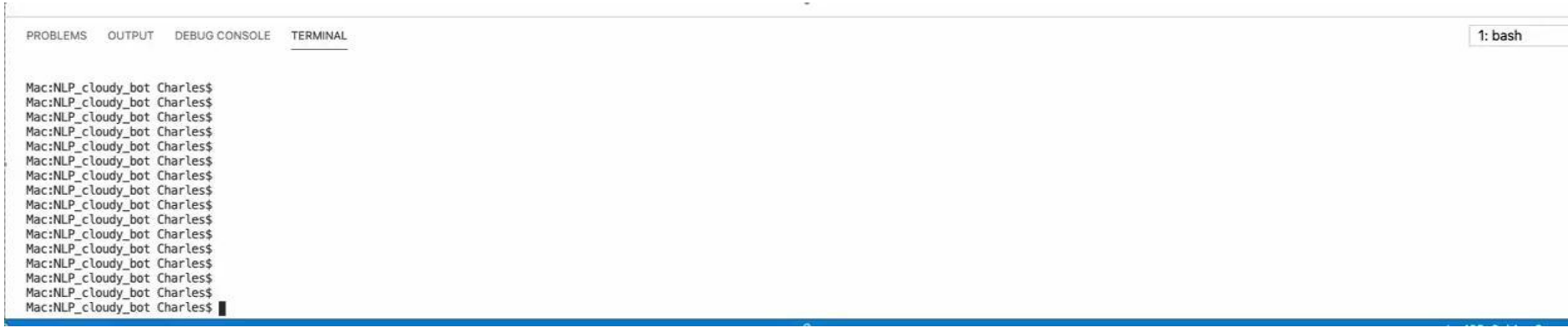
1. **Lambda** handles requests (pay per use)
2. **SageMaker** powers the AI with HuggingFace models
3. **DynamoDB** stores conversations
4. **Terraform** defines everything as code



```
> 1+1 equal to
🤔 Thinking...
🤖 Bot: 1,000, 000

> smart bot
🤔 Thinking...
🤖 Bot: I'm here to help! Could you please rephrase your question?
```

Demo/example



Tradeoff

- **Tradeoff**: SageMaker Serverless was chosen for pay-per-millisecond pricing with zero idle costs and access to the full Hugging Face model ecosystem, despite cold start delays of 3-10 seconds and additional setup complexity for IAM and container configurations.

- **Alternative**: Amazon Lex + Bedrock would provide simpler setup with minimal cold start issues at $0.00075 per turn, but lacks access to specialized Hugging Face models and custom fine-tuning capabilities needed for domain-specific chatbot behavior.

Challenges

1. HuggingFace Model Images
2. IAM Role Timing Issues
3. Terraform Complexity

Next Steps

- Web-based UI with React frontend
- Multi-model support (GPT-4, Claude, etc.)
- Vector database for context retrieval
- Real-time collaboration features

Thanks