

# New Skills, Same Packets

**cisco** Live !

Win as a Network Engineer with AI

Hank Preston, Distinguished Architect Learn with  
Cisco  
ccie 38336 | devnet expert 20220001

# Agenda

- 01 Introduction
- 02 AI Basics and Fundamentals
- 03 The Different AI “Hats” We Wear
- 04 AI Use Cases for Network Engineers
- 05 The Skills for the AI Enabled Network Engineer
- 06 Learn (AI) with Cisco
- 07 Closing

# The Evolution of Network Engineering

## 1. Early Networking

Spanning Tree / VLANs

## 2. Dot Com and The Internet

WAN Design / Routing Protocols / IPv6 / VoIP & QoS

## 3. Architectural Renaissance

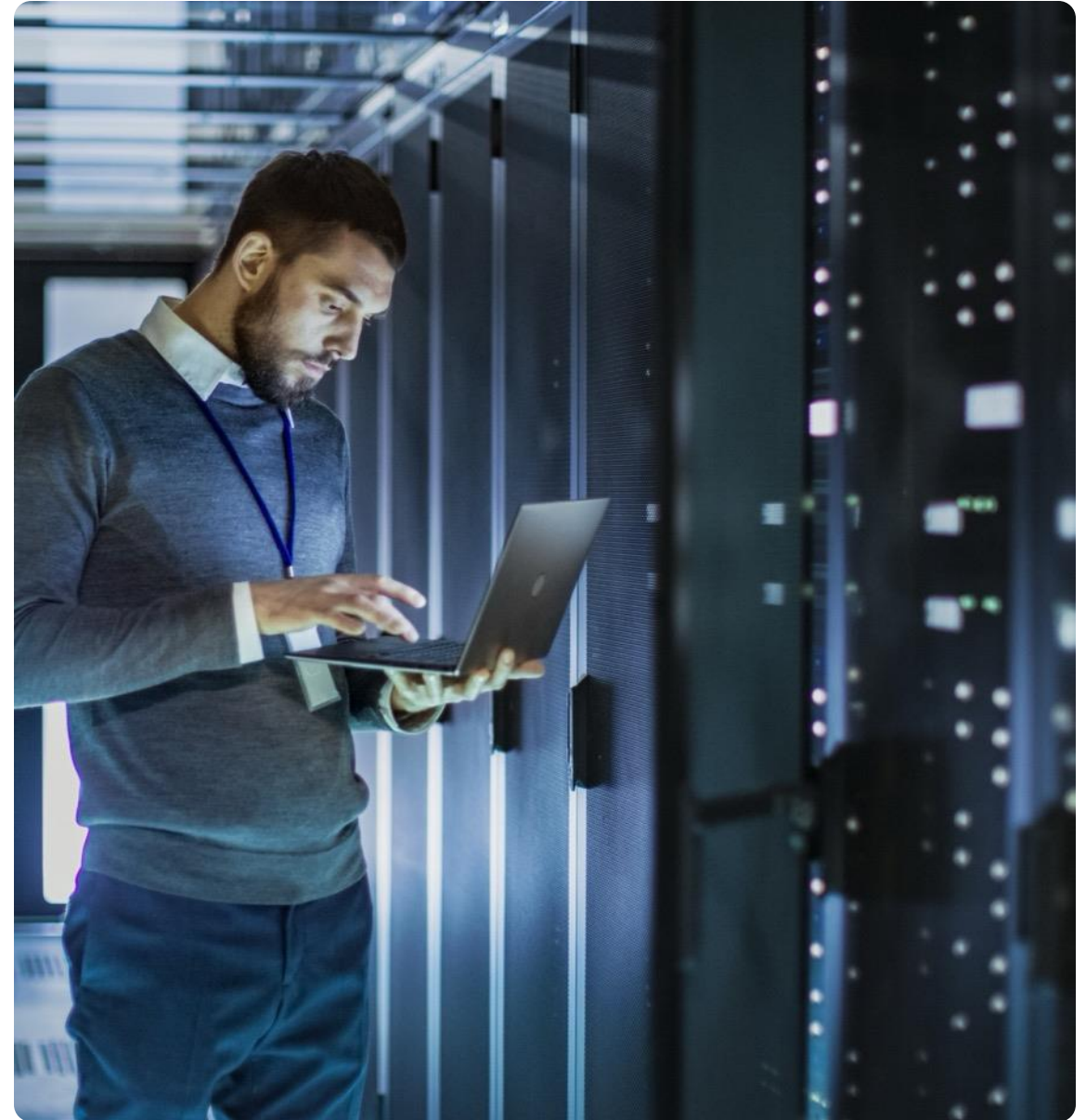
SDN / OpenFlow / Controllers / MP-BGP / VXLAN / Microsegmentation

## 4. Network Automation

APIs / Model Driven / Python / Cloud / Containers / NFV / NetDevOps / Software Defined X

## 5. Artificial Intelligence

Generative AI / LLM / Training / Inference / RoCE v2 / GPU / DPU / Agents / MCP



# Why the human network engineer still matters

- Innovates creative solutions to unprecedented network challenges
- Applies deep contextual understanding of business priorities and technical constraints
- Integrates new technologies thoughtfully into diverse, evolving environments
- Anticipates and addresses complex, multi-layered issues beyond AI's scope
- Translates business goals into resilient, adaptive network architectures
- Validates and interprets AI recommendations, preventing automation errors
- Provides accountability and trusted governance in critical situations



# Do we still need to learn networking?

- AI effectiveness depends on your expertise
- Real learning requires real effort
- Expertise takes practice, not shortcuts
- Innovation starts with humans
- AI is always catching up



# AI Basics and Fundamentals



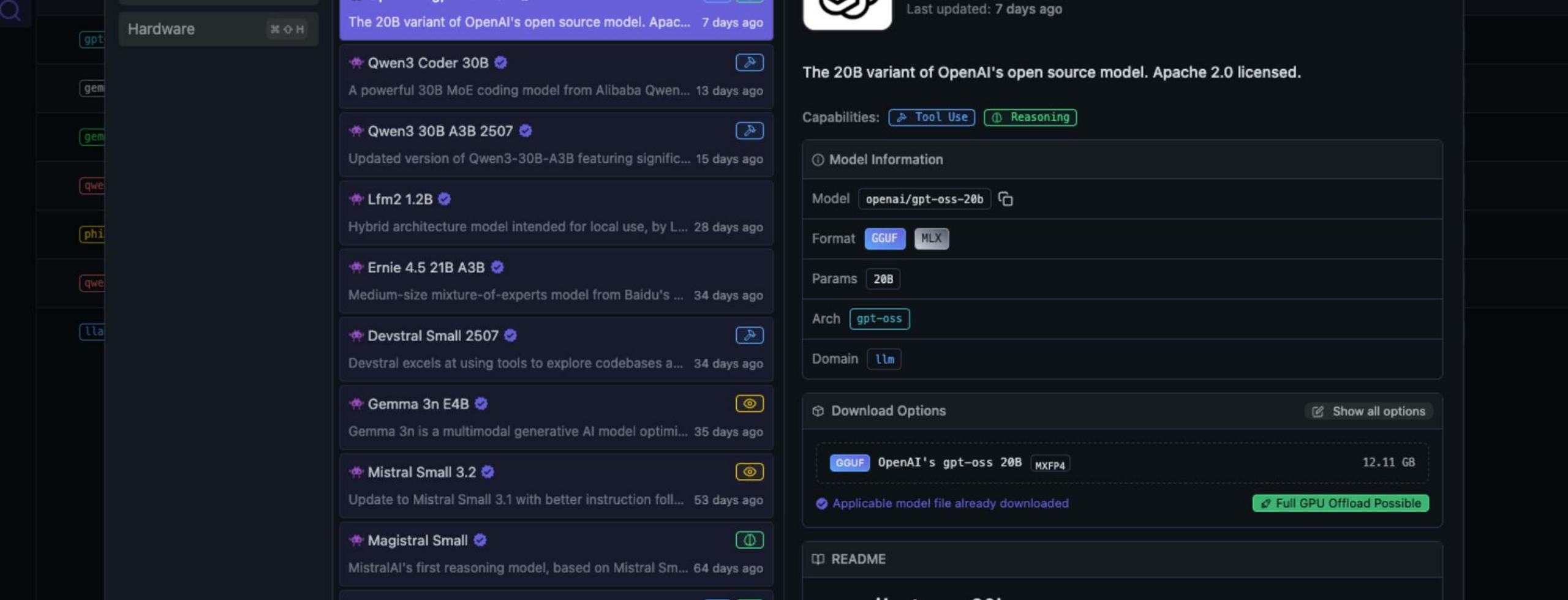
# Artificial Intelligence and Machine Learning



# Generative AI



# Agentic AI



# Model

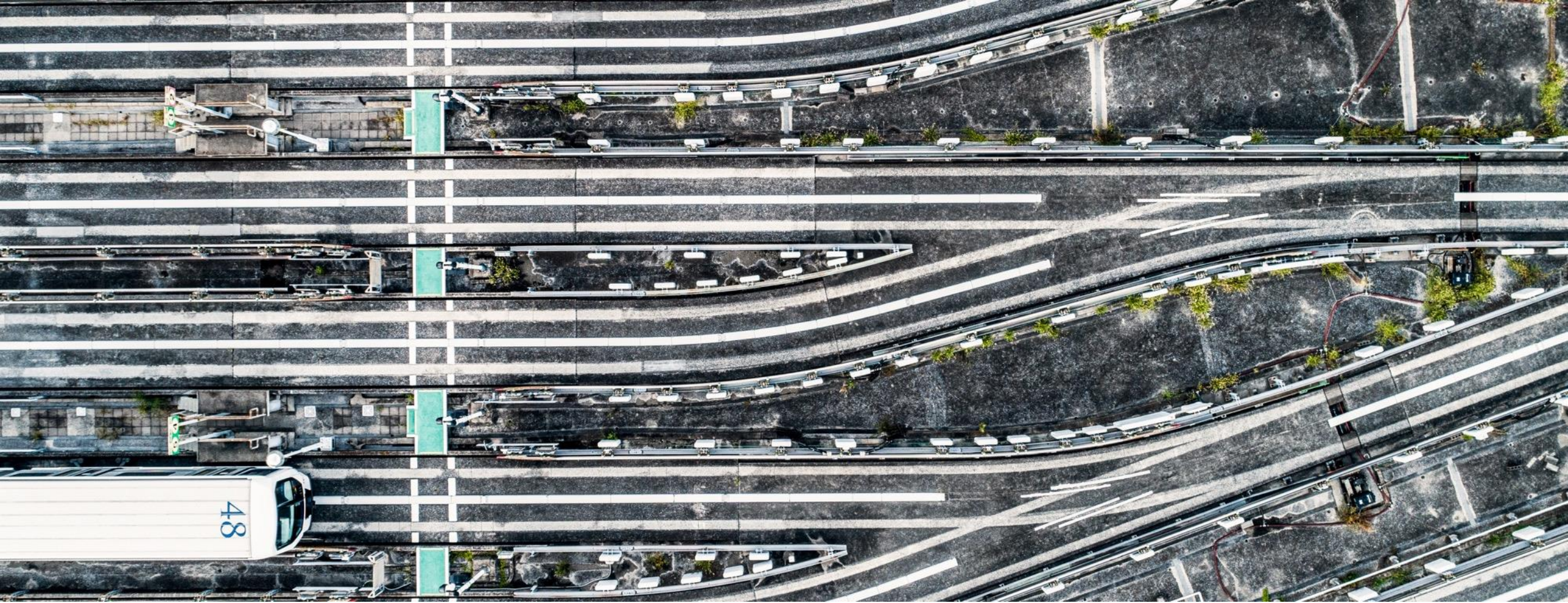


# Prompts and Prompt Engineering



AI Generated

# Hallucination



# Why is the network important?

# Different AI “Hats” for Network Engineers



**User of AI Tools**



**Supervisor of AI Tools**



**Builder of AI Infrastructure**

# User of AI Tools

- Routine Tasks and Data Analysis
- Content Generation
- Accelerate Root Cause Analysis
- Predictive Analytics
- Traffic Forecasting
- Anomaly Detection

# Supervisor of AI Tools

- Strategic Orchestration and Troubleshooting
- Validating AI-Driven Decisions
- Interpreting AI Forecasts
- Security Incident Response Oversight
- Governance and Accountability
- Troubleshooting AI Failures

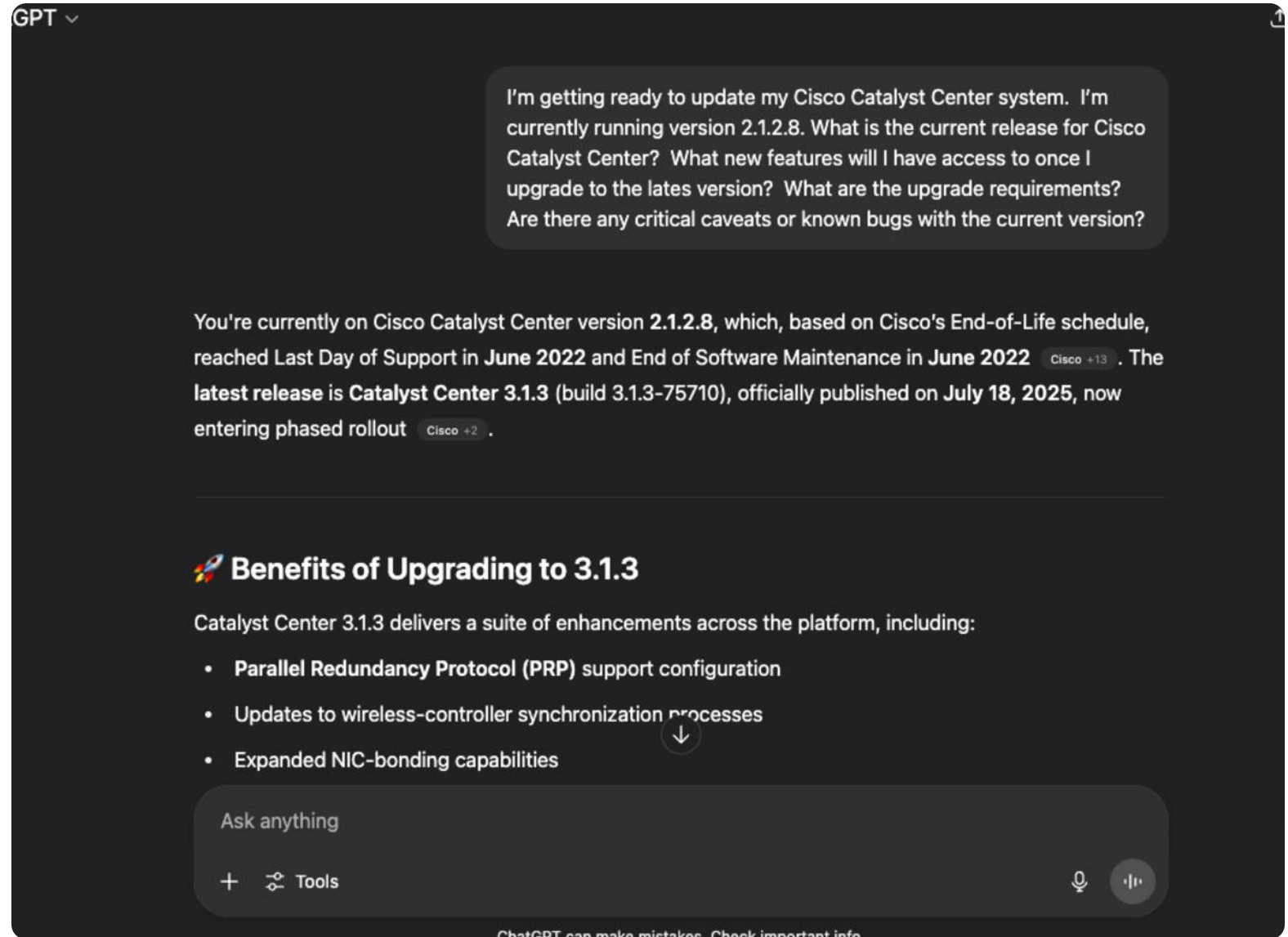
# Builder of AI Infrastructure

- Enabling Agentic AI for the Network
- Designing AI-Ready Infrastructure
- Developing AI Enhanced Automation Scripts
- Implementing AIOps Solutions
- Securing AI Clusters

# AI Use Cases for Network Engineers

# Using AI to help prepare for software upgrades

With web search built into most public AI tools today, leverage them to collect and correlate details across resources for a variety of planning actions.



The screenshot shows a ChatGPT chat window. At the top left, it says 'GPT' with a dropdown arrow. The user's message is: 'I'm getting ready to update my Cisco Catalyst Center system. I'm currently running version 2.1.2.8. What is the current release for Cisco Catalyst Center? What new features will I have access to once I upgrade to the latest version? What are the upgrade requirements? Are there any critical caveats or known bugs with the current version?'. The AI's response is: 'You're currently on Cisco Catalyst Center version 2.1.2.8, which, based on Cisco's End-of-Life schedule, reached Last Day of Support in **June 2022** and End of Software Maintenance in **June 2022**. The latest release is **Catalyst Center 3.1.3** (build 3.1.3-75710), officially published on **July 18, 2025**, now entering phased rollout'. Below this, there is a section titled 'Benefits of Upgrading to 3.1.3' with a list of features: 'Parallel Redundancy Protocol (PRP) support configuration', 'Updates to wireless-controller synchronization processes', and 'Expanded NIC-bonding capabilities'. At the bottom, there is a text input field with the placeholder 'Ask anything', a '+ Tools' button, and a microphone icon. A small disclaimer at the very bottom reads 'ChatGPT can make mistakes. Check important info'.

GPT

I'm getting ready to update my Cisco Catalyst Center system. I'm currently running version 2.1.2.8. What is the current release for Cisco Catalyst Center? What new features will I have access to once I upgrade to the latest version? What are the upgrade requirements? Are there any critical caveats or known bugs with the current version?

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### Benefits of Upgrading to 3.1.3

Catalyst Center 3.1.3 delivers a suite of enhancements across the platform, including:

- Parallel Redundancy Protocol (PRP) support configuration
- Updates to wireless-controller synchronization processes
- Expanded NIC-bonding capabilities

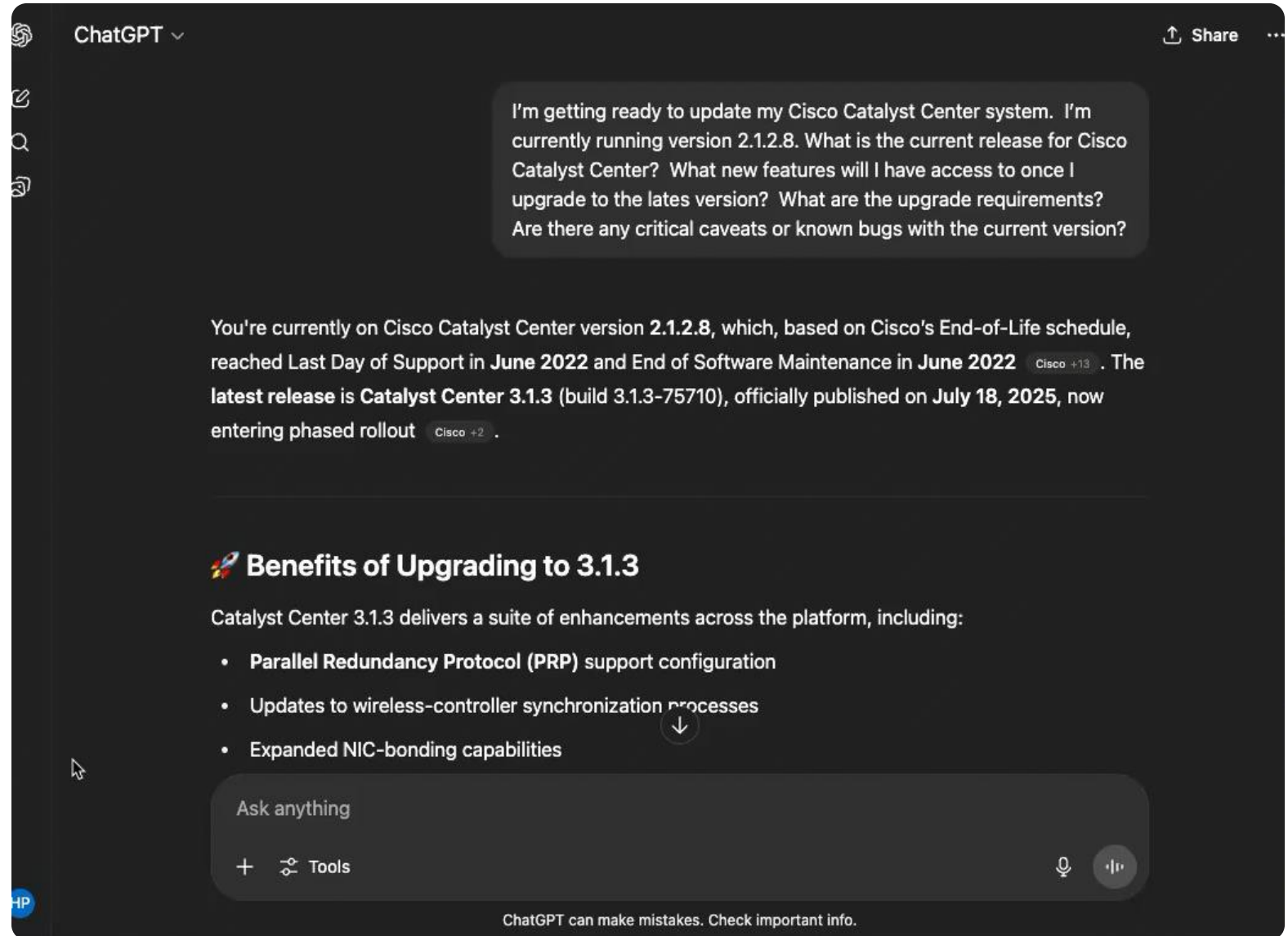
Ask anything

+ Tools

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The screenshot shows a ChatGPT chat window. At the top, the header says "ChatGPT" with a dropdown arrow. On the right, there is a "Share" button. The user's input is in a dark grey bubble: "I'm getting ready to update my Cisco Catalyst Center system. I'm currently running version 2.1.2.8. What is the current release for Cisco Catalyst Center? What new features will I have access to once I upgrade to the latest version? What are the upgrade requirements? Are there any critical caveats or known bugs with the current version?". The AI's response is in a lighter grey bubble. It states: "You're currently on Cisco Catalyst Center version 2.1.2.8, which, based on Cisco's End-of-Life schedule, reached Last Day of Support in June 2022 and End of Software Maintenance in June 2022 Cisco +13. The latest release is Catalyst Center 3.1.3 (build 3.1.3-75710), officially published on July 18, 2025, now entering phased rollout Cisco +2". Below this, there is a section titled "🚀 Benefits of Upgrading to 3.1.3" followed by the text "Catalyst Center 3.1.3 delivers a suite of enhancements across the platform, including:". A bulleted list follows: "• Parallel Redundancy Protocol (PRP) support configuration", "• Updates to wireless-controller synchronization processes", and "• Expanded NIC-bonding capabilities". Below the list is a "Ask anything" input field with a microphone icon and a "Tools" button. At the bottom, a small disclaimer reads "ChatGPT can make mistakes. Check important info."

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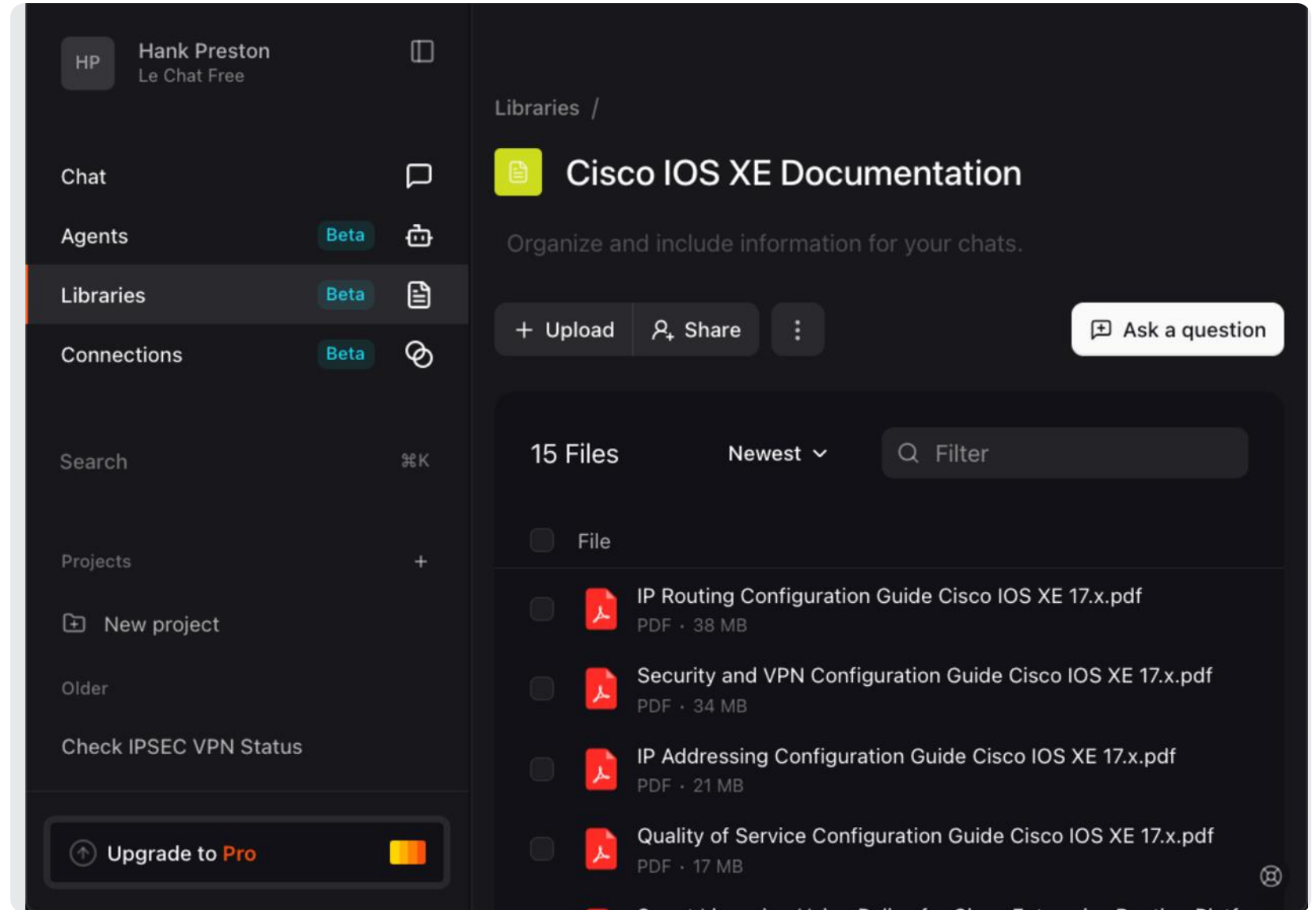
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+ Tools

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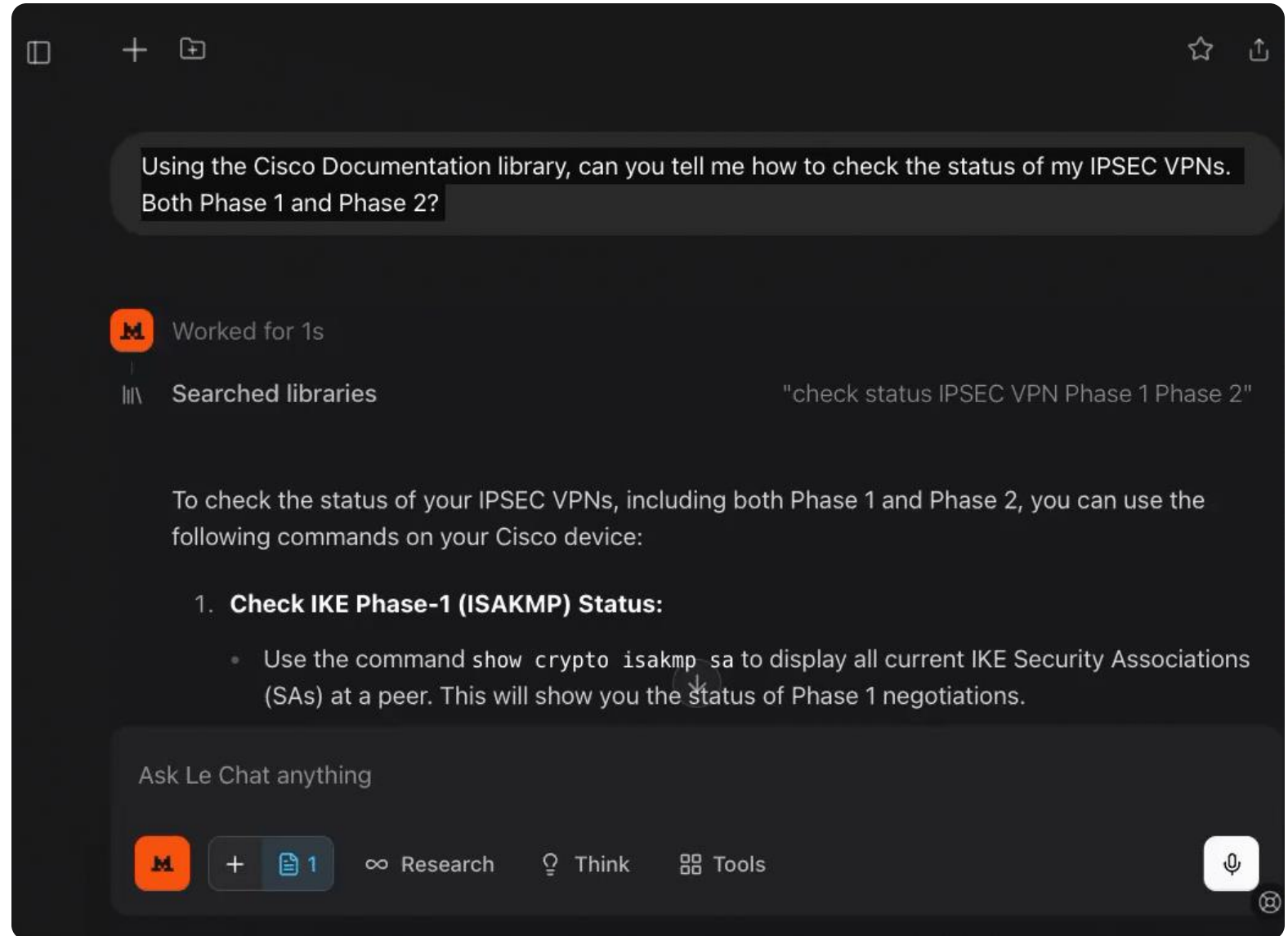
# Use document libraries for individual RAG

AI has access to vast quantities of data... but sometimes we just want answers from a selection of resources. Find an AI tool that lets you create collections of resources that are used to answer your questions.



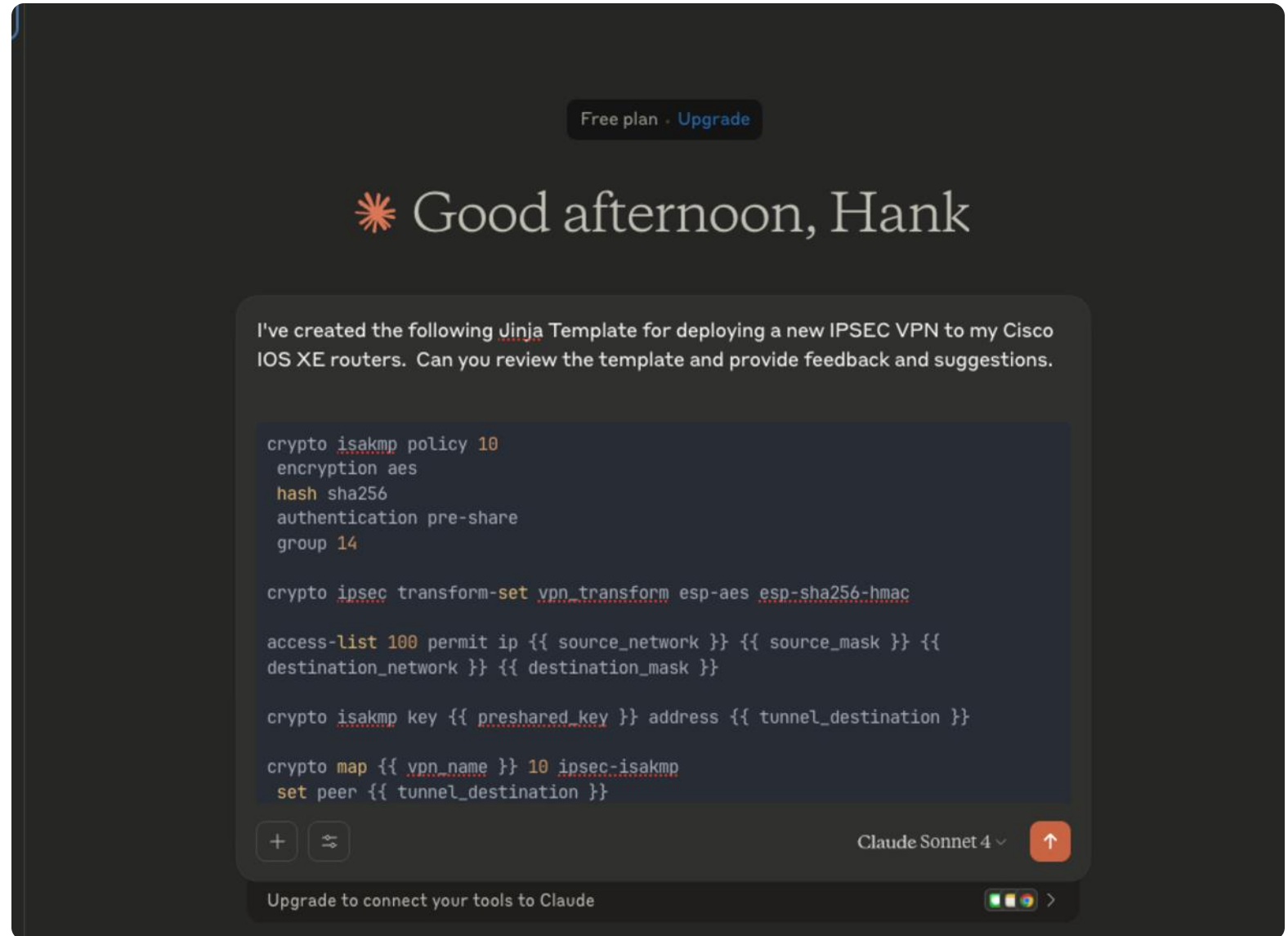
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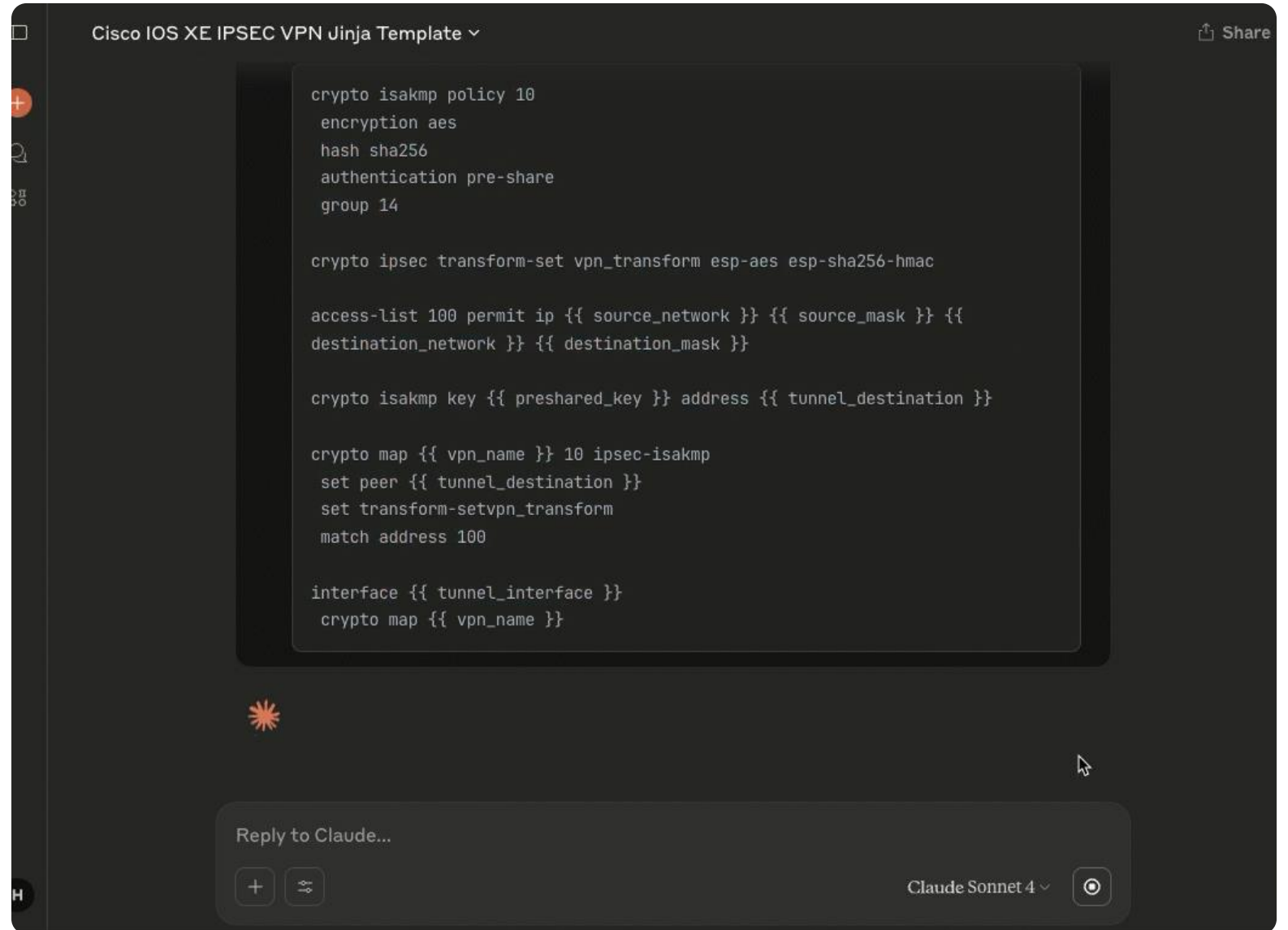
# Network Peer Reviewer

We can all benefit from a second set of eyes checking our work. But we don't always have another network engineer sitting at the next desk. AI makes a great alternative option.



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The screenshot shows the Claude AI interface with a dark theme. At the top, the title bar reads "Cisco IOS XE IPSEC VPN Jinja Template" with a dropdown arrow and a "Share" button. The main content area displays a Jinja2 template for a Cisco IOS XE IPSEC VPN configuration. The template includes variables for source and destination networks, masks, keys, names, and interfaces. Below the code, there is a red star icon and a "Reply to Claude..." input field with a plus icon and a settings icon. The bottom right corner shows "Claude Sonnet 4" with a dropdown arrow and a circular icon.

```
crypto isakmp policy 10
  encryption aes
  hash sha256
  authentication pre-share
  group 14

crypto ipsec transform-set vpn_transform esp-aes esp-sha256-hmac

access-list 100 permit ip {{ source_network }} {{ source_mask }} {{
destination_network }} {{ destination_mask }}

crypto isakmp key {{ preshared_key }} address {{ tunnel_destination }}

crypto map {{ vpn_name }} 10 ipsec-isakmp
  set peer {{ tunnel_destination }}
  set transform-setvpn_transform
  match address 100

interface {{ tunnel_interface }}
  crypto map {{ vpn_name }}
```

# Bring Agentic NetAI Agents to the Team

Agentic AI is a vision for a world where AI does more than respond to questions. It becomes part of our team, empowered by tools we give it, and driven by our goals.

You can start exploring the possibilities today!

Local Agentic NetAI

Appearance Clear All Duplicate

Context Model Program

Tools & Integrations

Connect MCP servers to LM Studio

Filter plugins...

rag-v1

What is the capital of France?

Can you teach me how to solve a Rubik's cube?

Can you show me a cool math proof?

Show prompt suggestions when creating a new chat

Type a met

Cisco Modeling Labs Workbench

NETAI HELLO WORLD

DASHBOARD TOOLS ADMIN

LAB NODES PANES GUIDE

patty-inbound

mgmt

router01

switch01

host01

CPU 0.25% MEMORY 2.56% DISK 23.29%

Python-mcp-pyats

Output

2025-07-22 15:34:26,945: NARICON-DMP0: connection to xpani: ssh -l netadon 188.67.95.18 1 -p 4881, 161: 4858842618 +++

2025-07-22 15:34:26,958: NARICON-DMP0: connection to router01 (netadon@188.67.95.181) Password:

router01#

2025-07-22 15:34:27,278: NARICON-DMP0: Storing credentials from default as current\_credentials is

2025-07-22 15:34:27,282: NARICON-DMP0: Learned hostname(s): 'router01'.

2025-07-22 15:34:27,283: NARICON-DMP0: +++ Initializing handle +++

2025-07-22 15:34:27,283: NARICON-DMP0: Learned hostname(s): 'router01'.

2025-07-22 15:34:27,311: NARICON-DMP0: +++ router01 with via 'ssh' executing command 'term length 8' +++

term length 8

router01#

2025-07-22 15:34:27,538: NARICON-DMP0: +++ router01 with via 'ssh' executing command 'term width 8' +++

term width 8

router01#

2025-07-22 15:34:28,365: NARICON-DMP0: +++ router01 with via 'ssh' executing command 'show version' +++

show version

Cisco IOS Software [IOSXE], Linux Software (X86\_64\_LINUX-ADVENTERPRISEK9-M), Version 17.15.1, RELEASE SOFTWARE (fc8)

Technical Support: <http://www.cisco.com/techsupport>

Copyright (c) 1986-2024 by Cisco Systems, Inc.

Compiled Sun 11-Aug-24 22:07 by mgpre

ROM: Bootstrap program is Linux

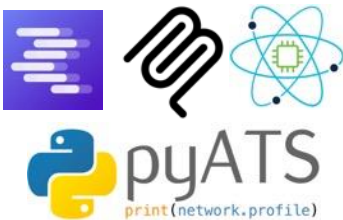
router01 uptime is 4 days, 1 hour, 22 minutes

System returned to ROM by unknown reload cause - suspect boot\_data[BOOT\_COUNTER] 0x0, BOOT\_COUNTER 0, BOOTDATA 18

System image file is "unix:/x86\_64\_crb\_linux-adventerprisek9-m-101"

Last reload reason: unknown reason

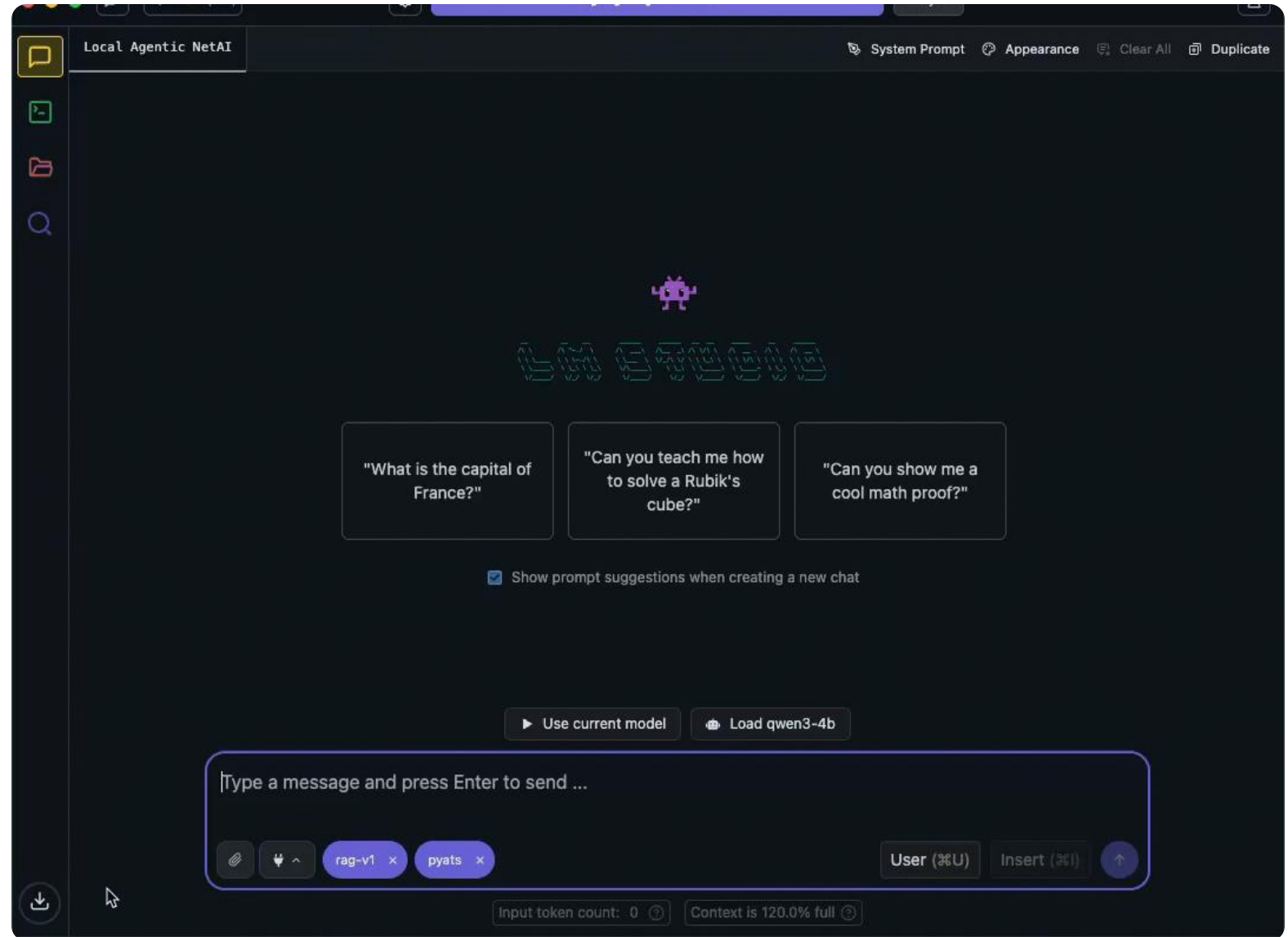
This product contains cryptographic features and is subject to United



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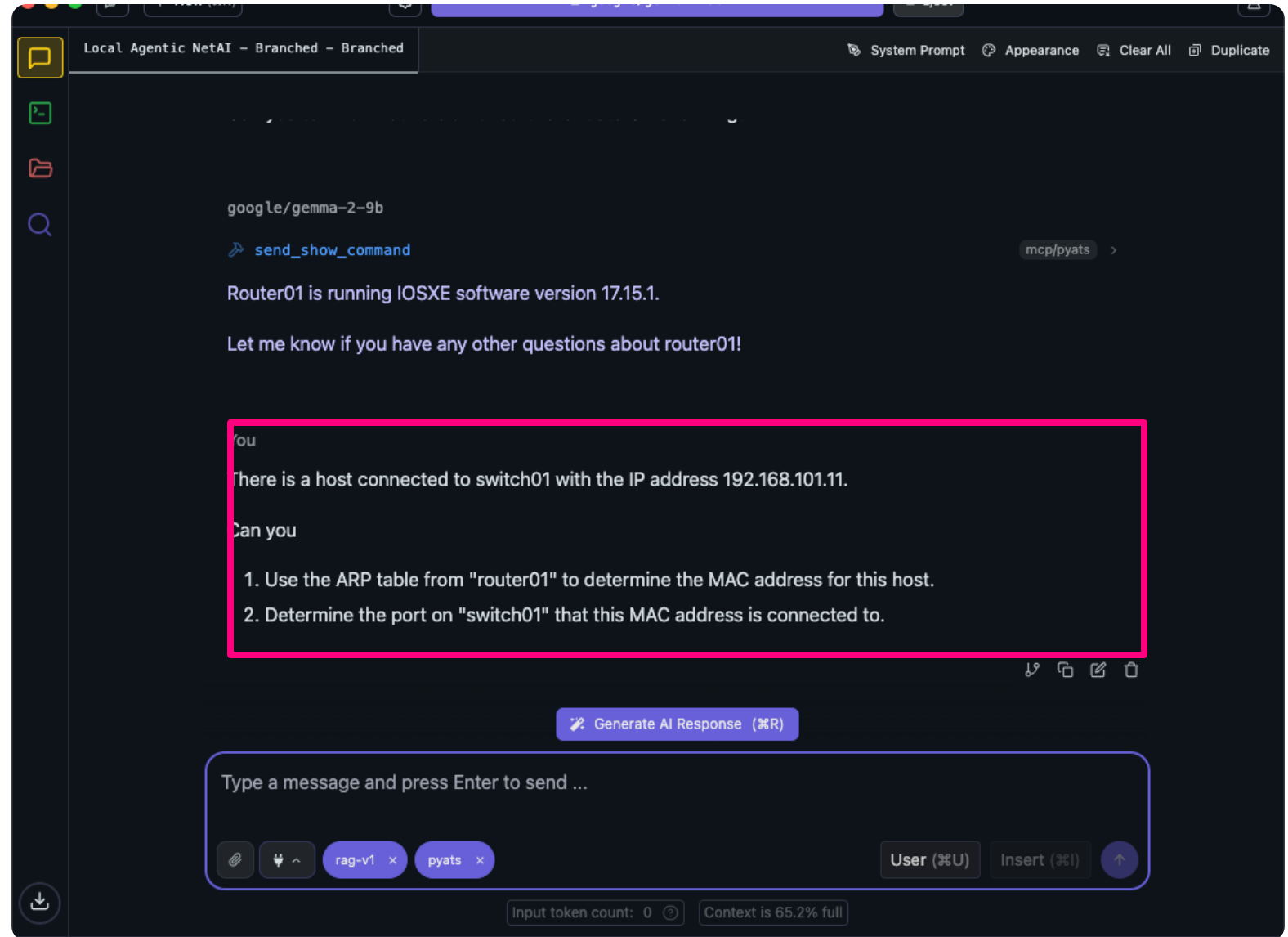
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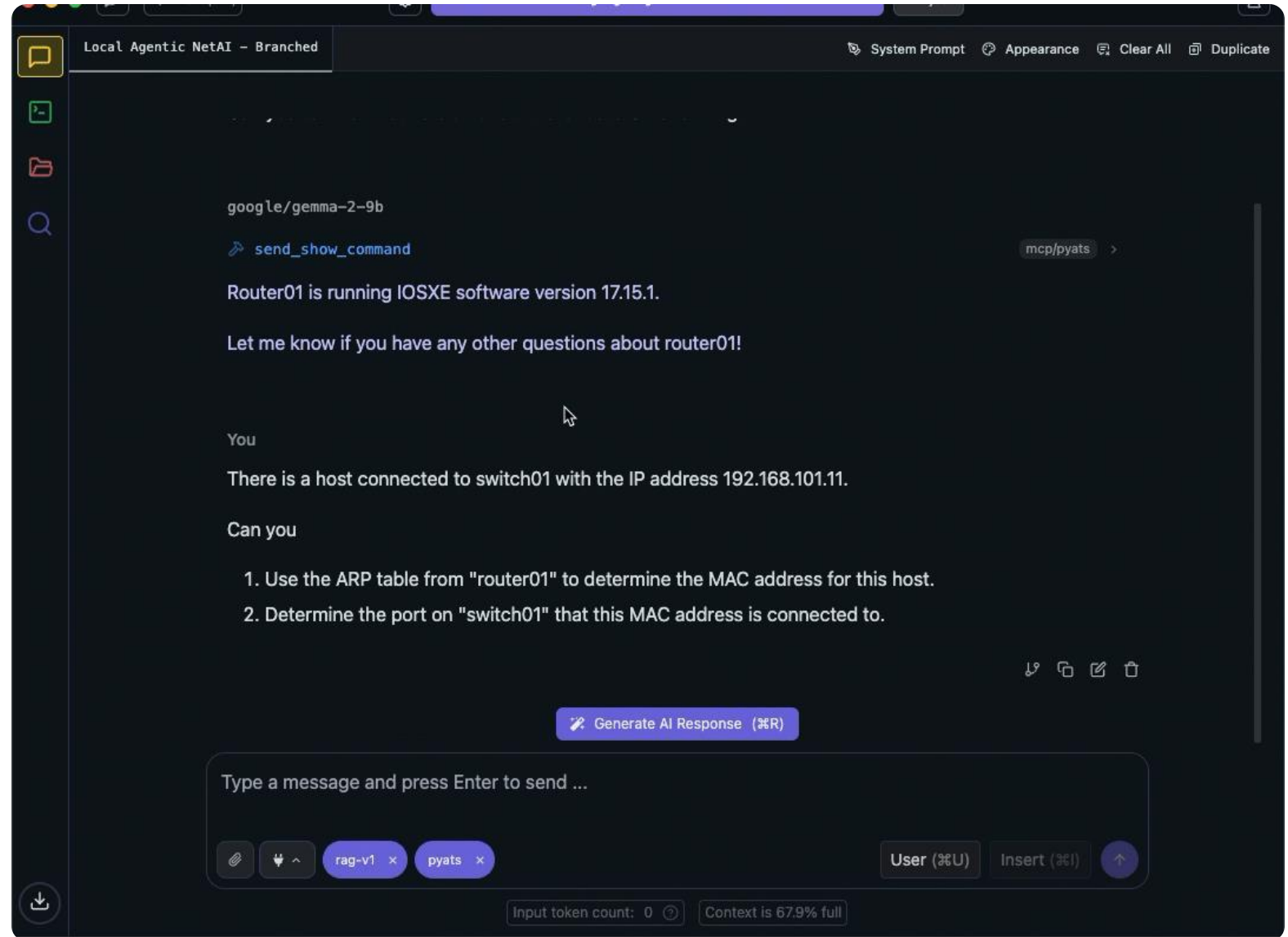
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# Roast My Network!

AI is super useful for a lot of network engineering activities. But GenAI can provide no end to laughs and fun for network engineers too.

DISCO

Modeling Labs

Workbench

QUIRKTECH NETWORK

DASHBOARD

TOOLS

ADMIN

LAB

NODES

PANES

GUIDE

QuirkTech Corporate Network

Byteville EC Network: 10.24.0.0/16

| Name       | VLAN ID | Subnet        |
|------------|---------|---------------|
| Management | 10      | 10.24.10.0/24 |
| Web        | 20      | 10.24.20.0/24 |
| Database   | 30      | 10.24.30.0/24 |
| Middleware | 40      | 10.24.40.0/24 |
| IoT        | 50      | 10.24.50.0/24 |

Profit Plaza Network: 10.192.0.0/24

| Name       | VLAN ID | Subnet      |
|------------|---------|-------------|
| Management | 10      | 7.7.7.7/??? |
| Users      | 101     | 7.7.7.7/??? |
| Printers   | 121     | 7.7.7.7/??? |
| IoT        | 201     | 7.7.7.7/??? |
| Guests     | 254     | 7.7.7.7/??? |

RD Network: 10.18.0.0/24

| Name       | VLAN ID | Subnet       |
|------------|---------|--------------|
| Management | 10      | 10.18.0.0/24 |
| Users      | 101     | 10.18.0.0/24 |
| Printers   | 121     | 10.18.0.0/24 |
| IoT        | 201     | 10.18.0.0/24 |
| Guests     | 254     | 10.18.0.0/24 |

Tricket Town Network: 10.128.0.0/15

| Name       | VLAN ID | Subnet          |
|------------|---------|-----------------|
| Management | 10      | 10.128.0.0/24   |
| Users      | 101     | 10.128.200.0/24 |
| Printers   | 121     | 10.128.201.0/24 |
| Plant1     | 666     | 10.128.64.0/18  |
| Plant2     | 667     | 10.128.128.0/20 |

Gizmo Grove Network: 10.130.0.0/15

| Name       | VLAN ID | Subnet          |
|------------|---------|-----------------|
| Management | 10      | 10.130.0.0/24   |
| Users      | 101     | 10.131.200.0/24 |
| Printers   | 121     | 10.131.201.0/24 |
| Plant1     | 666     | 10.130.64.0/18  |
| Plant2     | 667     | 10.130.128.0/20 |

Widget Woods Plant

| Name       | VLAN ID | Subnet          |
|------------|---------|-----------------|
| Management | 10      | 10.132.0.0/24   |
| Users      | 101     | 10.132.200.0/24 |
| Printers   | 121     | 10.132.201.0/24 |
| LegacyApp  | 999     | 10.132.204.0/24 |
| Plant1     | 666     | 10.132.64.0/18  |
| Plant2     | 667     | 10.132.128.0/20 |

Bargain Borough Sales Office

| Name       | VLAN ID | Subnet        |
|------------|---------|---------------|
| Management | 10      | 10.192.0.0/24 |
| Users      | 101     | 10.192.0.0/24 |
| Printers   | 121     | 10.192.0.0/24 |
| IoT        | 201     | 10.192.0.0/24 |
| Guests     | 254     | 10.192.0.0/24 |

Headquarters Network: 10.32.0.0/18

| Name       | VLAN ID | Subnet         |
|------------|---------|----------------|
| Management | 10      | 10.32.10.0/24  |
| Users      | 101     | 10.32.101.0/24 |
| Printers   | 121     | 10.32.121.0/24 |
| IoT        | 201     | 10.32.201.0/24 |
| Guests     | 254     | 10.32.254.0/24 |

WAN Network: 192.0.2.0/24

| Router     | IP Address | Site                         |
|------------|------------|------------------------------|
| DC1-NW     | 192.0.2.10 | Circuit Cove DC              |
| DC2-NW     | 192.0.2.11 | Byteville DC                 |
| RD-NW      | 192.0.2.12 | Headquarters                 |
| Tricket-NW | 192.0.2.13 | Research and Development     |
| PL1-NW     | 192.0.2.14 | Tricket Town Plant           |
| PL2-NW     | 192.0.2.15 | Gizmo Grove Plant            |
| W1-NW      | 192.0.2.16 | Widget Woods Plant           |
| W2-NW      | 192.0.2.17 | Bargain Borough Sales Office |
| W3-NW      | 192.0.2.18 | Profit Plaza Sales Office    |

ISP and WAN

Byteville Datacenter

Circuit Cove Datacenter

Profit Plaza Sales Office

Research and Development

Tricket Town Plant

Gizmo Grove Plant

Widget Woods Plant

Bargain Borough Sales Office

Headquarters

Important Details:

DNS Server: 10.10.10.11

Lab Credentials:

| Node Type            | Username | Password |
|----------------------|----------|----------|
| Network Devices      | netadmin | cnalab   |
| HQ-NETWORK           | netadmin | cnalab   |
| Hosts, Printers, IoT | cisco    | cisco    |

Router Loopback Address Info

| Loopback # | Address         | Site                         |
|------------|-----------------|------------------------------|
| DC1-NW     | 10.255.255.1/32 | Circuit Cove DC              |
| DC2-NW     | 10.0.0.1/32     | Byteville DC                 |
| RD-NW      | 10.0.0.12       | Headquarters                 |
| Tricket-NW | 10.0.0.13       | Research and Development     |
| PL1-NW     | 10.0.0.14       | Tricket Town Plant           |
| PL2-NW     | 10.0.0.15       | Gizmo Grove Plant            |
| W1-NW      | 10.0.0.16       | Widget Woods Plant           |
| W2-NW      | 10.0.0.17       | Bargain Borough Sales Office |
| W3-NW      | 10.0.0.18       | Profit Plaza Sales Office    |

Credentials for HQ-NETWORK:

netadmin / cnalab

Internet Networks: 198.51.100.0/24

Region

IP Address

ISP-INET

198.51.100.1

DC1-INET

198.51.100.6

NAT Pool

198.51.100.11-15

3.88%

MEMORY

16.73%

DISK

23.30%

0

OK

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# The Skills for the AI Enabled Network Engineer

- 184% growth for AI related skills in job postings
- 18% - 47% higher salary for AI skilled professionals

# What do we learn?

## General AI Proficiency

- Critical Thinking
- AI Fundamentals
- Prompt Engineering
- Data Literacy
- Programming – Python
- Natural Language Processing (NLP)

## Specialized AI for Networking

- Network Automation and SDN
- AIOps/NetDevOps
- AI Enhanced Security
- Cloud Networking for AI/ML
- Hardware Acceleration and SmartNICs
- AI Ready Infrastructure Design

# Automation Specific Skills

- Python (you're shocked I know)
- Network APIs and Interfaces
- AI assisted coding
- Common AI library use
- Agentic AI architectures
- Tool / Agent development
- LLM Evaluation

# Security Specific Skills

- Implementing Zero Trust Architecture (ZTA) and micro segmentation for AI clusters
- Defending against adversarial ML attacks
- Model supply chain security
- Privacy preservation techniques
- Compliance automation



But HOW can I learn it all?



But HOW can I learn it all?

You can Learn (AI) with Cisco

# The Cisco U Difference for AI Skill Building

Tutorials, Skills-Based, Hands-On, and Adjacent Learning



# Start Here Now!

## Get Started Using AI

- [Introduction to Modern AI](#)
- [Cisco AI Business Practitioner | AIBIZ](#)
- [Understanding AI and LLMs as a Network Engineer](#)
- [Hands-On ChatGPT: Leveling Up Your Network Engineering GPT Prompts](#)

## Get Started Supervising AI

- [Introduction to AI Vulnerabilities](#)

## Get Started Building AI

- [Run Your Own LLM Locally For Free and with Ease](#)
- [AI Solutions on Cisco Infrastructure Essentials](#)
- [A New Frontier for Network Engineers: Agentic AI That Understands Your Network](#)

Closing

# Key Takeaways

- AI Is Here to Empower, Not Replace You
- Your Skills Will Evolve and Become Even More Valuable
- Cisco Is Updating Certifications and Training for the AI Era
- You'll Have Access to Hands-On Learning and Support
- Together, We'll Build the Networks of the Future

Stay in touch!

# Hank Preston

Webex/Email: [hapresto@cisco.com](mailto:hapresto@cisco.com)

Blogs: <https://blogs.cisco.com/author/hankpreston>



Thank you

**CISCO** Live !