

AI Meets Network Engineering

Practical Tools for the Human Layer

NY(NUG)

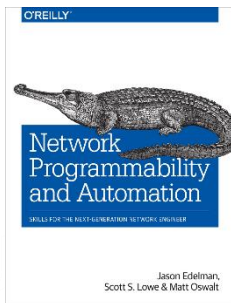
Jason Edelman @jedelman8

Network to Code @networktocode

February 26, 2025

About Me

- Jason Edelman
- Before 2014 → Networking, CCIE
- Since 2014 → Founder/CTO of Network to Code
- Co-author → O'Reilly Network Programmability & Automation; Packt Network Automation with Nautobot
- **Passionate about transforming careers & networks**



>>> network .toCode()



AI Is Changing Everything

We should be worried.

Real-World Perspective

"If I didn't have AI, I don't know how I'd do my job."

Intrinsic Motivation



AI & Networking – The Three Dimensions

Networking for AI

*Building data centers
& fabrics for AI
workloads*

AI for Networking

*AI automating and
optimizing networks*

AI for Network Engineers

*Using AI-powered tools
to work smarter*

AI for Network Engineers

 NotebookLM



GitHub
Copilot



OpenAI
ChatGPT



 NotebookLM

Think **Smarter**, Not Harder

Your Personalized AI Research Assistant

NotebookLM is currently experiencing issues that may affect the quality of your experience. Follow us on X or Discord for updates.

Sources

+ Add sources

Search the web for new sources

Web Fast Research

Select all sources

- QS_7300_Modular.pdf
- QS_7500N_Modular.pdf
- QS_7500_Modular.pdf
- QS_7700R4.pdf
- QS_7800_Modular.pdf

Chat

5 sources

These documents serve as a comprehensive **installation and quick start guide** for the **Arista 7500 Series Modular Data Center Switches**, including the 7504 and 7508 models. They provide critical **physical specifications** and **environmental requirements**, such as necessary floor space and cooling clearance, to ensure optimal hardware performance. Detailed instructions cover the **rack-mounting process** for both two-post and four-post configurations, alongside essential **safety precautions** regarding electrostatic discharge and power redundancy. Furthermore, the guides outline the **cabling procedures** for power supplies and supervisor modules, as well as the initial **software configuration** steps to bypass Zero Touch Provisioning. Visual appendices help technicians identify **hardware components** and interpret **LED status indicators** for various line cards, fans, and fabric modules. Together, these sources ensure that qualified personnel can safely and effectively **deploy and maintain** modular switching infrastructure.

Save to note

What are the key hardware differences between the 7300, 7500, and 7800 switch series?

How do I perform a Zero Touch Provisioning bypass for initial manual configuration?

What are the critical safety and ESD precautions for hot-swapping modular components?

Monday, February 23

What are the primary differences between the 7300, 7500, and 7800 series?

The primary differences between the Arista 7300, 7500, and 7800 series switches lie in their physical dimensions, slot capacities, power requirements, and linecard support. The **7500 series represents the highest scalability and power density** among the three, while the 7300 and 7800 series cater to different

Start typing... 5 sources

Studio

+ Create notebook Share Settings

- Audio Overview
- Video Overview
- Mind Map
- Reports
- Flashcards
- Quiz
- BETA Infographic
- BETA Slide Deck
- Data Table

Generating Audio Overview...
Come back in a few minutes

Generating Slide Deck...
based on 5 sources

Installing the 1,580 Pound Arista 7816
5 sources · 1d ago

Interactive

Add note

Installing the 1,580 Pound Arista 7816

00:31 / 21:59

Studio > Audio Overview

Installing the 1,580 Pound Arista 7816

2 hosts

Studio

- Audio Overview
- Video Overview
- Mind Map
- Reports
- Flashcards
- Quiz
- Infographic **BETA**
- Slide Deck **BETA**
- Data Table

⏸ Join ↻

Notebook LM for Network Engineers


AI-Powered Insights

Upload Documents → Ask Questions → Get Insights

Use Case	How it Helps	Example Questions
Parsing & Summarizing Network Design Docs	Extracts key details from HLD/LLD documents	What redundancy mechanisms are in place? What changes are needed for scaling?
Troubleshooting Guide Generation	Generates workflows, suggests fixes, and compares vendor steps	OSPF stuck in EXSTART-what next? Compare Cisco vs. Juniper troubleshooting steps
Network Automation Script/Playbook Review	Analyzes Ansible, Python, Netmiko/Nornir scripts	What does this playbook or script do? What are the risks of running it?
Compliance & Policy Verification	Checks configs against security policies & standards	Does this config comply with PCI? Are there any outdated settings?
Vendor Comparison & Decision Making	Summarizes differences in specs, licensing, and features	How does Cisco's switch compare to Arista? What are the key licensing differences?
Incident Post-Mortem Assistance	Analyze logs, identified failure patterns, and suggest improvements	What caused this outage? What best practices can prevent this in the future?



GitHub Copilot

- 
- New chat**
- Agents
- Spaces
- Spark Preview

- Agent sessions +
- Chats +

 Collapse
jedelman8
Copilot Pro

CLI Download



Ask anything

Ask All repositories + GPT-5.2 ▶

- Task
- Create issue
- Spark
- Git
- Pull requests

Recent agent sessions

No sessions found. Create one by sending a prompt above.

[Copilot](#) uses AI. Check for mistakes.

GitHub Copilot for Network Engineers

AI-Powered Coding Assistance

AI-assisted coding → Faster Automation → Fewer Errors

Use Case	How it Helps
Automating Network Tasks with Python & Ansible	Generates Python scripts, Ansible playbooks, and Jinja templates based on simple prompts
CLI Configuration Generation	Suggests CLI configuration for Cisco, Juniper, Arista, and other vendors
Debugging & Fixing Network Automation Code	Detects syntax errors, suggests fixes, and improves efficiency
API Integrations	Assists with API calls to network devices (Netmiko, Nornir, REST APIs)
Learning & Documentation Support	Provides code explanations and suggests improvements for juniper engineers



>>> nautobot

Q Press Ctrl+K to search

ntc

- FAVORITES
- DEVICES
- IPAM
 - IPAM: 7
 - ORGANIZATION: 7
 - CIRCUITS
 - VPN
 - POWER
 - WIRELESS
 - DEVICE LIFECYCLE
 - SECRETS
 - LOAD BALANCERS
 - VIRTUALIZATION
 - CLOUD
 - DESIGNS
 - APPROVALS
 - EXTENSIBILITY
 - GOLDEN CONFIG
 - JOBS
 - APPS

Organization	IPAM	Virtualization
Locations 21 Hierarchical geographic locations	VRFs 2 Virtual routing and forwarding tables	Clusters 2 Clusters of physical hosts in which VMs reside
Tenants 7 Customers or departments	Prefixed 108 IPv4 and IPv6 network assignments	Virtual Machines 12 Virtual compute instances running inside clusters
Dynamic Groups 7 Groups of related objects	IP Addresses 151 IPv4 and IPv6 network assignments	Data Sources
DCIM	VLAN 26 Layer two domains, identified by VLAN ID	Git Repositories 4 Collections of data and/or job files
Racks 10 Equipment racks, optionally organized by group		
Device Types Physical hardware models by manufacturer		
Devices Rack-mounted network equipment, servers, and other d		
Virtual Chassis Represents a set of devices which share a common con		
Controllers Represents a network or SDN (Software-Defined Netwo		
Device Redundancy Groups Represents a set of devices which operate in a failover/h		
Interface Redundancy Groups		
Floor Plan		
Floor Plans Floor Plan layouts		
Floor Plan Tiles		

Nautobot Arista AVD App

Claude Code v2.1.52
Opus 4.6 · Claude Max
~/direct-design

```
/clear  
L (no content)
```

I need to add a few data models to Nautobot. I need to add a few from Arista AVDs. Just a quick prototype to add Fabrics, VXLAN, and maybe 1-2 more models. Can you please add this to my instance of Nautobot? Build it as a Nautobot App. Use our best practices and standards.

plan mode on (shift+tab to cycle)

Wireless

Change Log

Modified Diagraminstance NYC01 — 12 Topology

Claude Code for Network Engineers

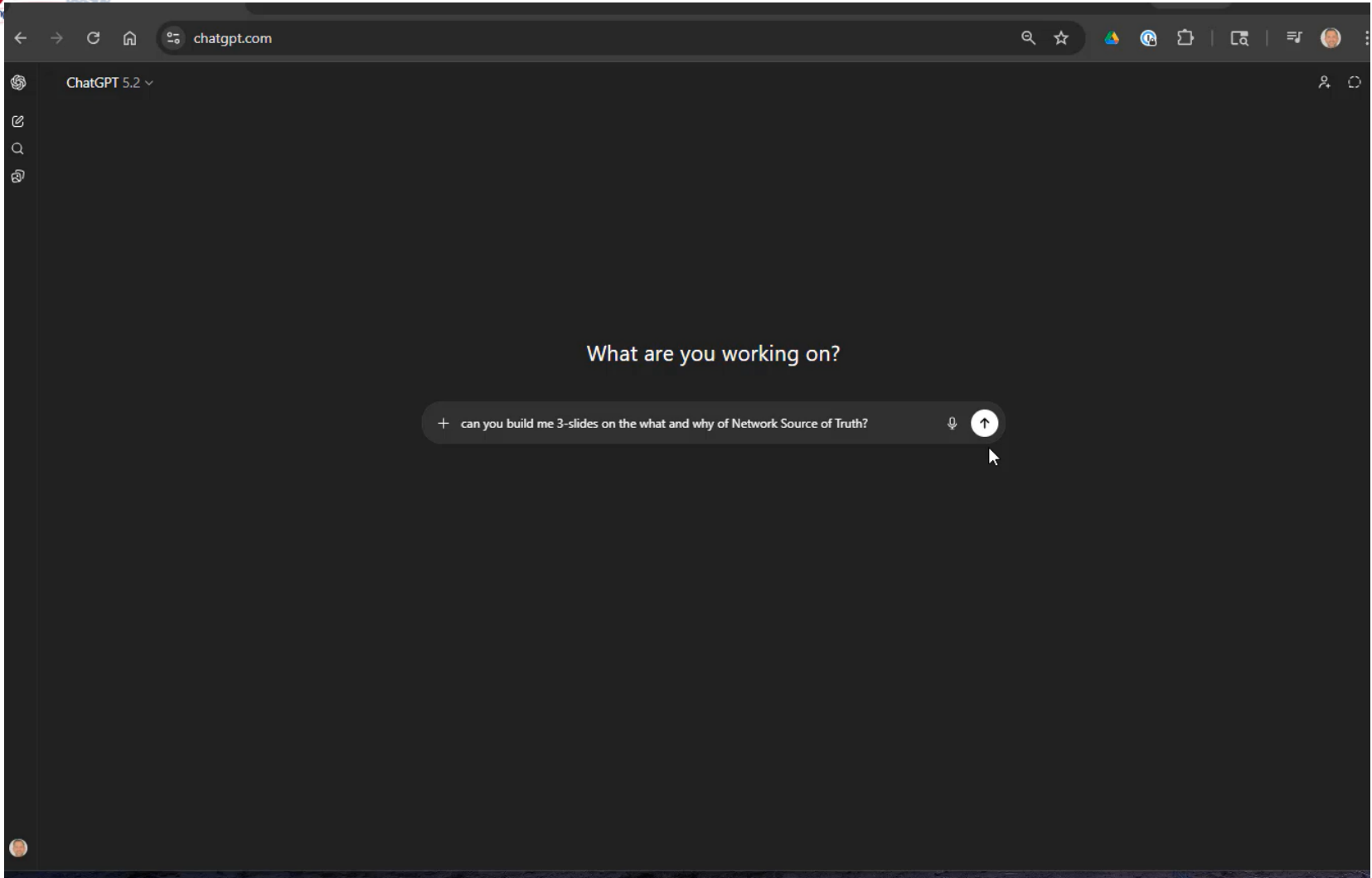
AI-Powered Engineering & System Reasoning

AI-Assisted Engineering → Faster Troubleshooting → Safer Automation

Use Case	How it Helps
Multi-File Refactoring	Analyzes and modifies code across multiple files consistently and safely
Debugging Complex Failures	Traces errors through logs, stack traces, containers, and services
Infrastructure & DevOps Troubleshooting	Identifies root causes across automation infrastructure, device communications, and service dependencies
Architectural Design	Helps design systems, data models, and workflows
Large Feature Implementation	Breaks down complex features into steps and executes iteratively
Terminal-Aware Problem Solving	Interprets CLI output and suggests corrective actions
Repository-Wide Code Analysis	Understands patterns across the repo to improve structure and consistency
Migration & Upgrade Planning	Creates structured upgrade paths and refactor strategies



OpenAI
ChatGPT



ChatGPT for Network Engineers

AI-Powered Knowledge

Get instant answers, generate content, and streamline workflows

Use Case	How it Helps	Example Questions
Justifying Investments & Decisions	Helps articulate ROI, cost-benefit analysis, and business justifications	<i>How do I justify investment in network automation?</i>
Command Reference & Troubleshooting	Provides Linux, Git, and network commands with explanations	What is the Linux command to check all open ports? How do I roll back a commit in Git?
Creating Documentation & Reports	Generates outlines for RFPs, technical documentation, and reports	Create an RFP checklist for network monitoring tools.
Meeting Agenda & Strategy Planning	Structures meeting meetings with key discussion points and objectives	Draft an agenda fo a network strategy review meeting.
Change Management & Impact Analysis	Summarizes changes, creates RFCs, and outlines risk impact	Describe a network change and its impact on operations. Outline a change request for a firewall migration.
Learning & Best Practices	Summarizes concepts, explains protocols, and suggest best practices	Explain the differences between VXLAN and MPLS. What are the best practices for BGP security?
AI-Driven Analysis & Decision Support	Works alongside Notebook LM to analyze RFP responses, network trends, and reports	Summarize key takeaways from this RFP response.

NTC NautobotGPT



NTC NautobotGPT

Create a job which produces a report in CSV format that includes:

- Device Name
- Manufacturer
- Model
- End of Life Date
- End of Support Date
- Support Contract Number

+



NautobotGPT

To create a Nautobot job that generates a CSV report with the specified information, you'll need to follow several steps. This will involve defining a job in Nautobot that queries device information, compiles it into CSV format, and writes it to a file. Here's how you can set it up:

1. **Define the Job:** Create a new Python file in the Nautobot jobs directory.
2. **Write the code:** Below is a sample job that will generate the CSV report. It assumes that end-of-life, end-of-support dates, and contract numbers are attributes or can be accessed via related objects.

```
python Save Copy
1 from nautobot.apps.jobs import Job, register_jobs
2 from nautobot.dcim.models import Device
3 import csv
4
5 class DeviceReportJob(Job):
6     class Meta:
7         name = "Generate Device Report"
8         description = "Generates a CSV report including device details and associated support"
9
10    def run(self, **kwargs):
11        # Prepare the CSV file
12        file_path = self.create_file("device_report.csv")
13
14        # Open file for writing
15        with open(file_path, mode="w", newline='') as csvfile:
16            csv_writer = csv.writer(csvfile)
17
18            # Write CSV headers
19            csv_writer.writerow(["Device Name", "Manufacturer", "Model", "End of Life Date",
20
21
22            # Query devices
23            devices = Device.objects.all()
24
25            for device in devices:
26                # Fetch necessary information
```

NTC NautobotGPT

Generate a list with the following details for our access layer switches:

- Switch Manufacturer
 - Switch Model
 - Count of each
- +



NautobotGPT

Here is a breakdown of your access layer switches by **manufacturer**, **model**, and **device count**:

Manufacturer	Model	Count
Cisco	Catalyst 9300	220
Cisco	Catalyst 9200	180
Juniper	EX4300	140
Arista	7050SX	100
HPE	Aruba 2930F	90
Dell	N1548P	75
Extreme	X440-G2	65
Cisco	Catalyst 2960X	55
Juniper	EX2300	40
Arista	7010T	35

Let me know if you'd like this grouped differently or scoped to a specific site or role.

NautobotGPT for Network Engineers

AI-Powered Knowledge & Coding for Nautobot

Get instant knowledge and Nautobot Jobs

Use Case	How it Helps	Example Questions
AI-Assisted Job Creation & Modification	Suggests, writes, and optimizes Nautobot Jobs (Python scripts) for network automation.	<i>Can you generate a Nautobot Job to update device interfaces based on a CSV file?</i>
Troubleshooting & Debugging Nautobot Jobs	Identifies errors, suggests fixes, and explains Nautobot Job execution steps.	<i>Why is my Nautobot Job failing with this traceback?</i>
Querying & Extracting Data from Nautobot	Helps craft API queries, GraphQL statements, and database lookups.	<i>How do I query all devices running EOS in a specific site using GraphQL?</i>
Documentation & Best Practices	Explains Nautobot data models, APIs, and best practices for network automation.	<i>How does the Nautobot Circuit model relate to the Provider model?</i>

Evolve through Continuous Learning

Ensure you're using AI every day.

The End.