

The Next Gen Network Engineer (NGNE) for 2026

Managing and Leveraging Disruption

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Scott Robohn

- Husband, Dad to 4, Bestefar (Grandpa) to 6 (7 in 2026)
- Network Plumber: 35+ years in the networking industry
- Technology auditor, network operator, instructor, TAC engineer, SE, SE leader
and now...
- Consultant focused elevating Operations, AI, automation
- Helping clients rationalize adoption of AI and emerging tech



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Introduction to NGNE

- What is NGNE? (A Curriculum w/pre-reqs and 100/200/300/400 level topics and Electives)
- Where does NGNE come from? >>>>
- AI and the NGNE
- Where is it going? (ABE)



Disruption and the Next Generation



Disruption is real:

- Telephone switchboard
- Assembly line
- Paper accounting ledgers
- Pick your favorite story



BIG IDEA

NetOps is increasingly **downstream** from Software Development

Increasing literacy in software development processes and models means the process and tooling knowledge is becoming more common in NetOps



Constant arrival of new tech and tools:

AI and other new tech keep coming at us



As a result, we need more than subnets, spanning tree, and pcaps:

The NGNE

From TNOps to NGNE: Big ideas from 30+ years



Think broadly: Systems thinking

Your Ops Stack is more interconnected than you think.



Develop discipline around proactive evaluation of new tools and technologies.



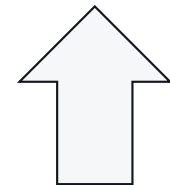
Org disruption:

Total Network Operations seeks to evaluate new tools and tech to determine how the NetOps organization must evolve.



Personal disruption:

NGNE provides a framework for you to personally adopt new tools and tech.



YOU ARE HERE

Here we go...

NGNE Development: Pre-reqs

- Networking basics absolutely still matter
 - CCNA / JNCIA / Arista L1 / etc.
 - WiFi: CWNE, vendors
 - Equivalent experience
- On theoretical programs
- Don't assume – people coming into networking with all the non-networking skills
 - Give them a chance to catch up



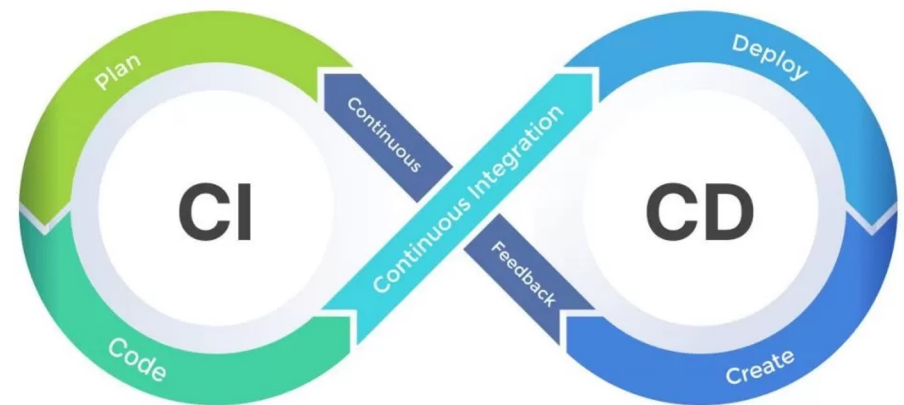
NGNE Development: 100 Level

- Linux: the OG OS
- Python (or another language suited for automation (Go))
- GitHub (or another SCCS)
- Containers, Docker, and Virtual Machines
- Intro cloud platform experience
- Virtual Lab Environments
- APIs
- Intro to LLM chat tools
- *AI for Ops: moving fast, becoming real (more on this)*
- *AI-enhanced learning* of all 100/200/300/400 level topics
- Vendor skills: driven by product decisions, add to your learning plan accordingly

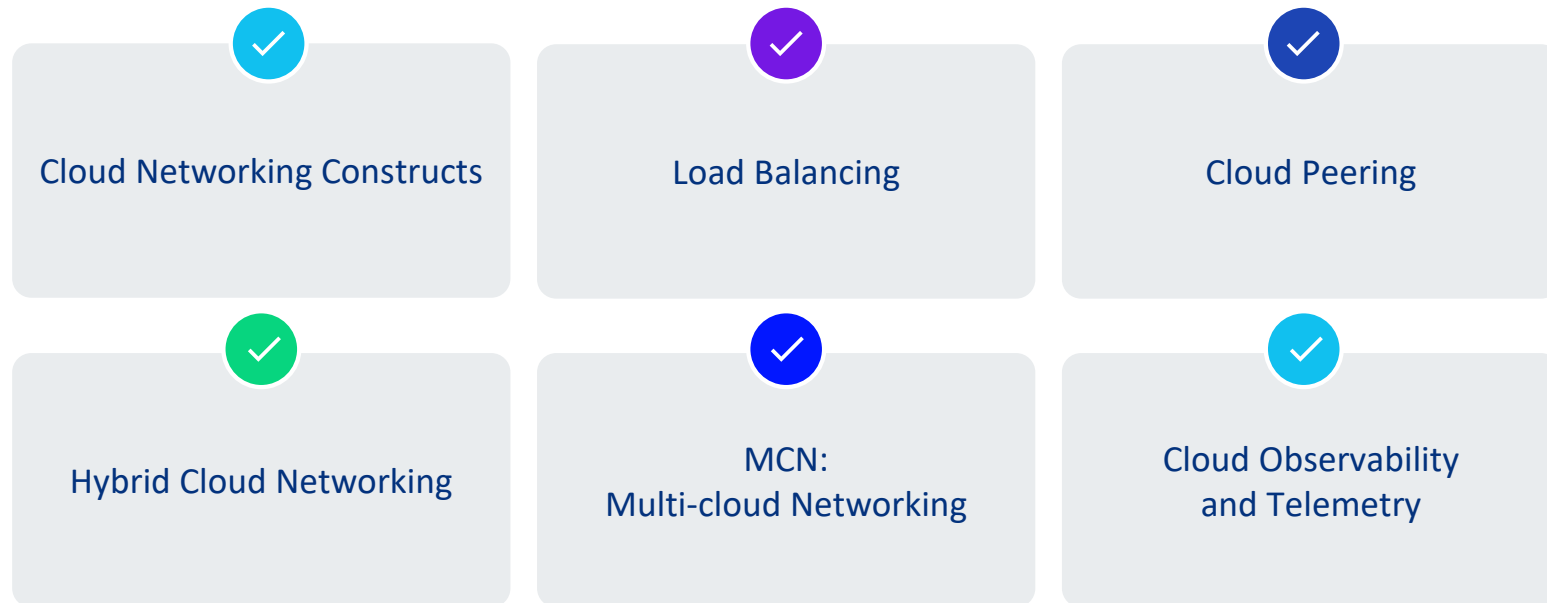


NGNE Development: 200 Level

- DevOps Concepts and Principles
- Automation Concepts
- Source of Truth (SoT)
- Ansible
- CI/CD Pipelines
- Alignment with Git
- Orchestration Concepts
- Focused AI Experimentation



NGNE Development: 300 Level



NGNE 300: Cloud Networking Constructs

Networking between physical on-prem and cloud (and between clouds)

- AWS, Microsoft Azure, Google Cloud Platform, Oracle Cloud Infrastructure, and others.

Start with the platform that your org is already committed to, or the one they are moving to

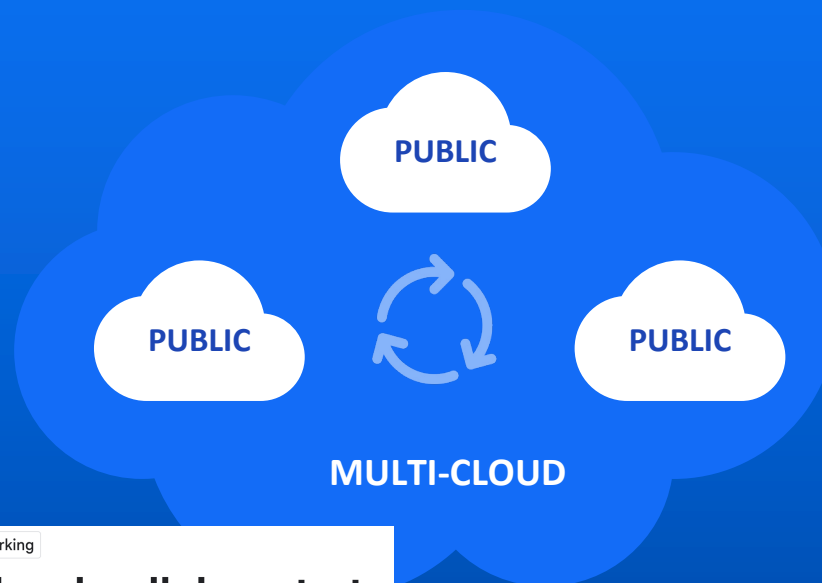
- Become familiar with the networking constructs.

Cloud networking is highly abstracted away from hardware

- Understand the definition and utility of the basic functions in the cloud such as compute, storage, firewall, and database.

NGNE 300: Hybrid and Multi-Cloud Networking

- Networking between and among public cloud and SaaS providers
- Dealing with different features, constructs, SLAs, billing methods, etc.
- Handling applications distributed across cloud providers (e.g., front in AWS, backend in Azure)
- Using tech like SD-WAN, cloud overlays, etc. to unify cloud experience
- Update: GCP and AWS>>>



Networking

AWS and Google Cloud collaborate to simplify multicloud networking

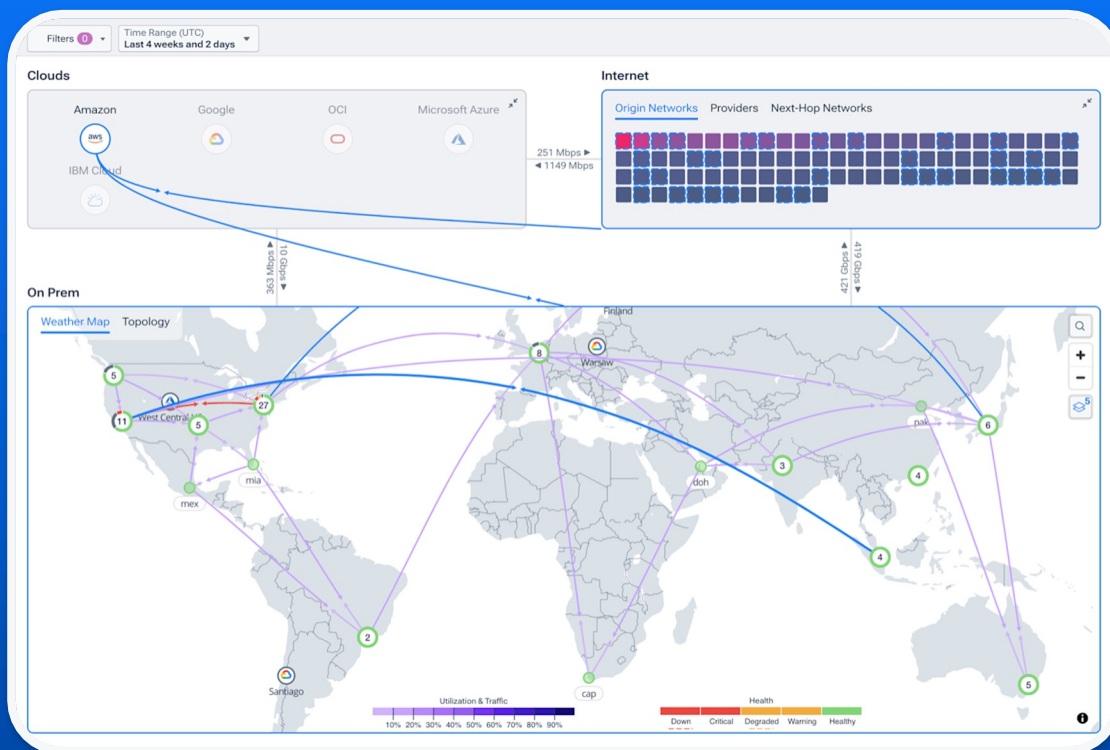
November 30, 2025

Rob Enns
VP/GM of Cloud Networking, Google Cloud

Robert Kennedy
VP of Network Services, Amazon Web Services

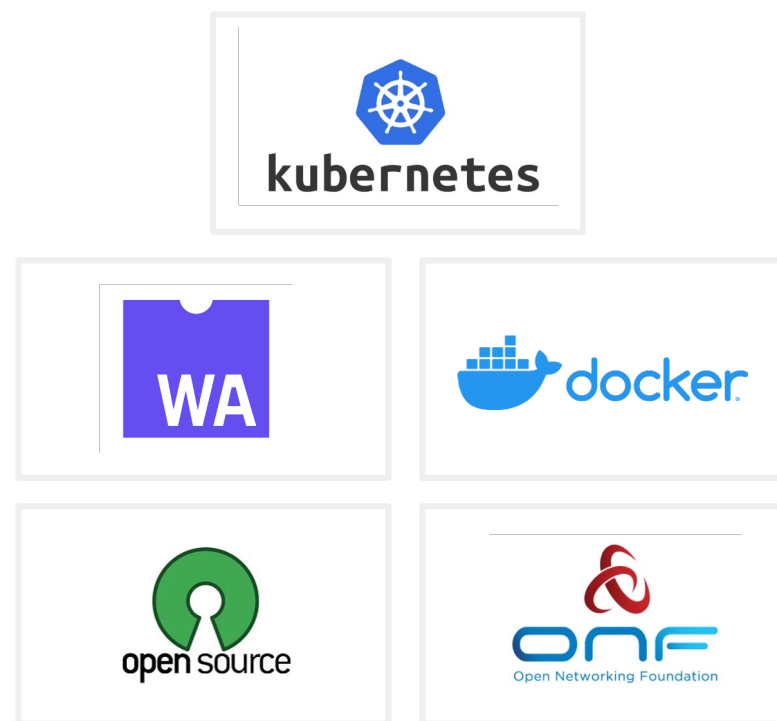
NGNE 300: Cloud Observability and Telemetry

- Cloud flow logs
 - AWS VPC Flow Logs
 - GPC Flow Logs
 - Azure NSG Flow Logs
 - Azure VNet Flow Logs
- Cloud metrics
- WAN Router, firewall, Load balancer, SD-WAN telemetry
- Service provider telemetry and path tracing
- eBPF metrics
- Application, billing, customer, app/security tag metadata enrichment
- Opportunity for AI – HUGE – cross-domain



NGNE Development: 400 Level

- Kubernetes (infra and app knowledge)
- Understanding Open Source
- Open Networking
- Web Assembly
- Digital Twins
- Security
- Other NetOps Stack Adjacencies (Optical, more)
- Continuous Tech and Tool Evaluation



NGNE Electives: Important Things Not Yet Placed

Specialized wireless/radio technologies

5G

ORAN

6G

LoRa

AND MORE

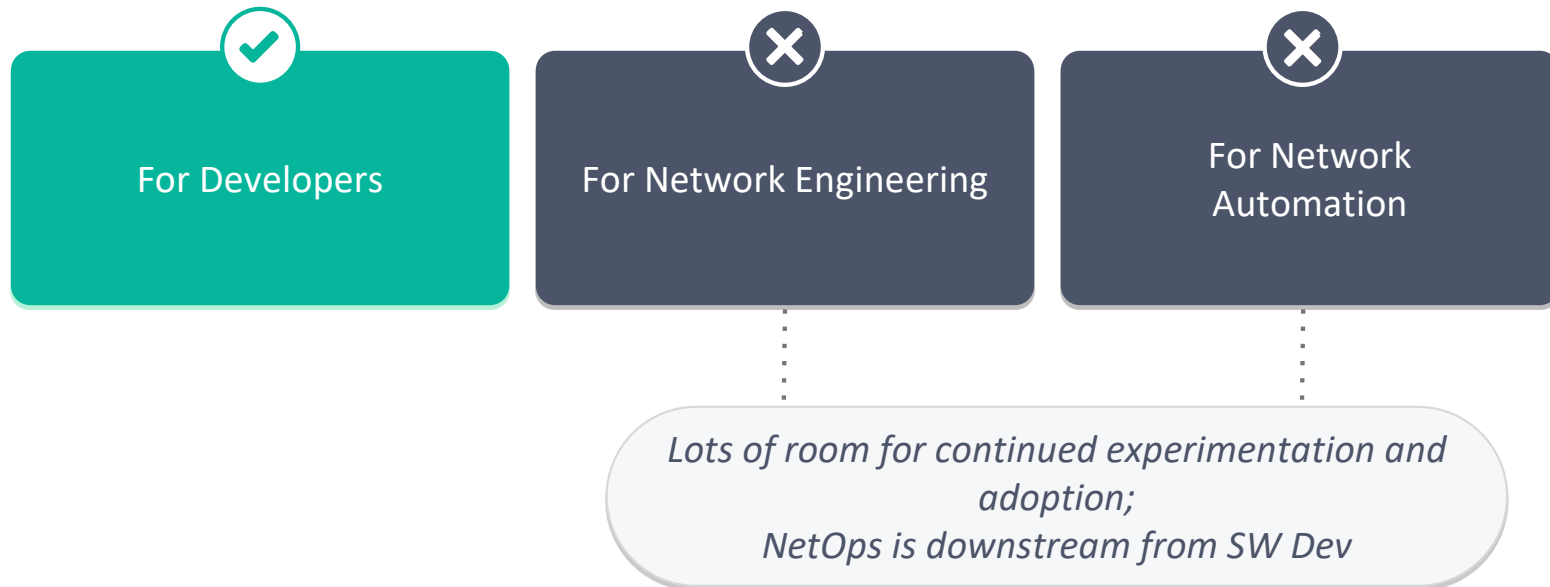
Deming Primer

Application of manufacturing engineering principles to NetOps

AI and the NGNE



Was 2025 the Year of AI agents?



AIOps in 2026



More vendor-provided
platforms with agents



More tools to help document
and optimize workflow



More complex and nuanced
combinations

- New computational tools
- Traditional tools

OpenClaw and Security

Logging & Monitoring

Secrets Management

Data Protection

Secure Deployment
Architecture

Supply Chain & Code
Security

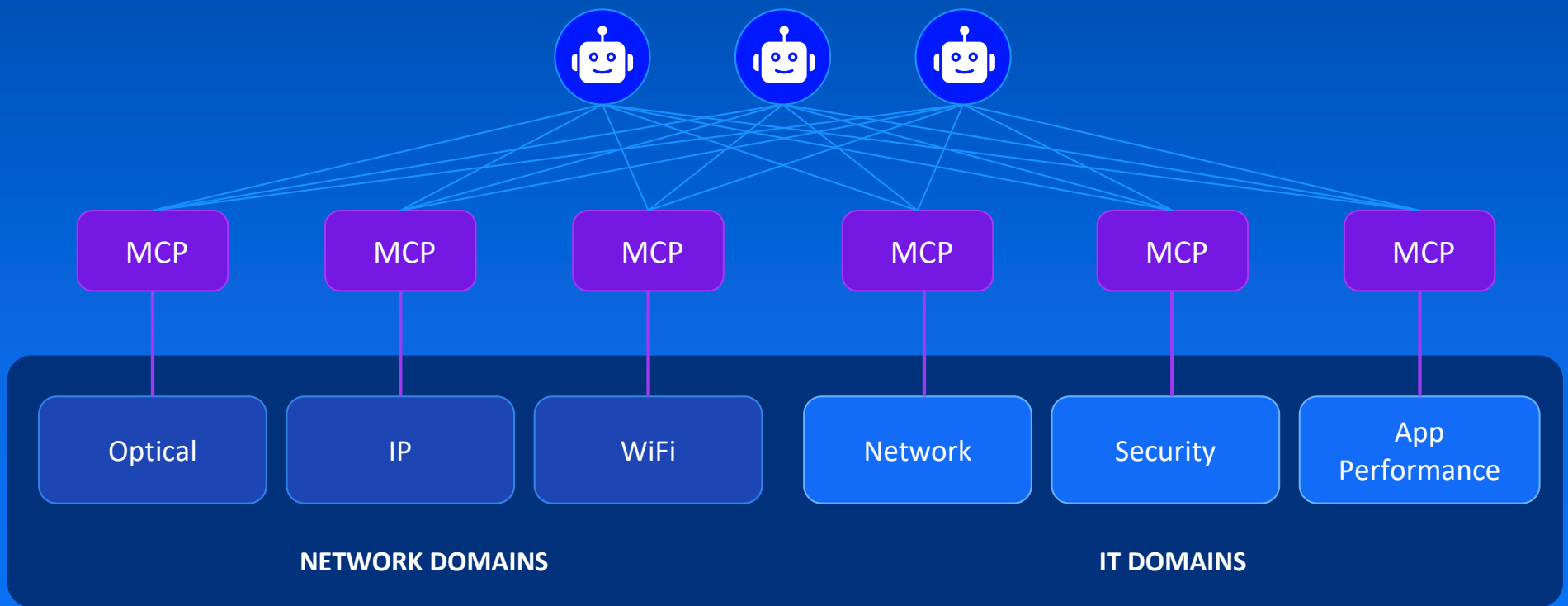
IAM

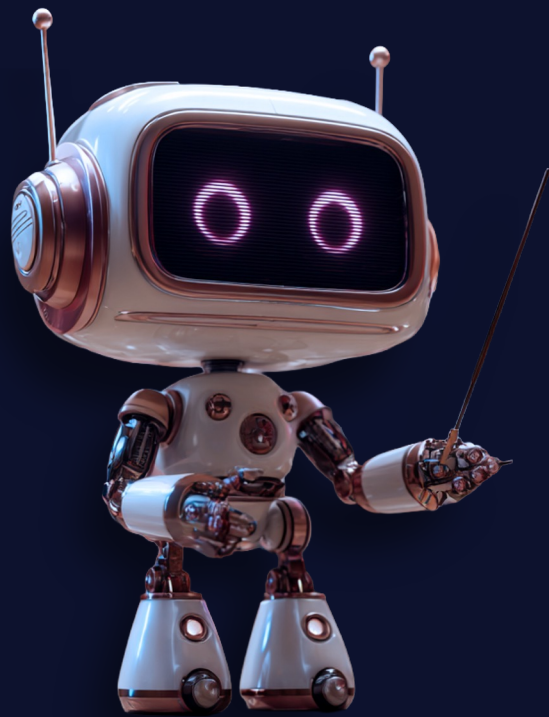
Operational Controls



OpenClaw

Coming Soon: Multi-Domain/Multi-Modal AI





AI Boss Skills

- The orchestration and management of agents and AI system components
- If you prefer: Digital Coworkers
- Junior staff, requires supervision, but can get real work done
- Clawdbot – just the next step

Criticality of Data Quality

How should we prioritize data quality and clean-up as we move toward building xLMs?

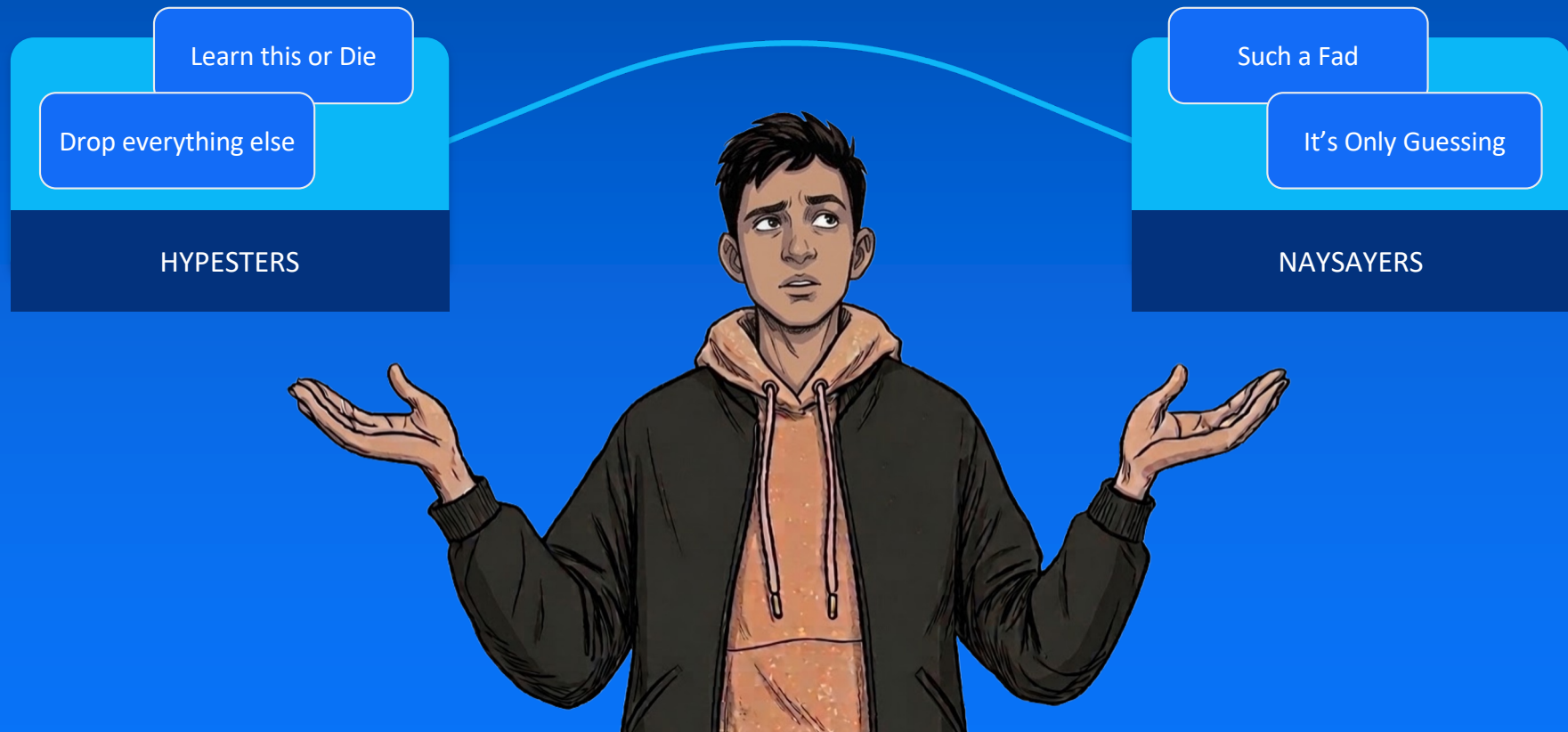
How about xLMs for JNCIE, CCIE, or NRS for troubleshooting?

What data would you trust putting into building those models?



SINKHOLE OF BAD DATA

How do I pick trusted AI info sources?



On Trusting AI Info Sources

- Choose Many Sources (more than a few)
- Are they really building?
- Is this a Marketing function intended to grab attention? (That's not bad by itself - just be aware)
- Beware of giving too much trust to an agent without guardrails
- "New employee" approach (point to the guy on X): they get their own identity, their own laptop (environment), limited access, and their work is checked
- Experimenting and trying things outside of production is great - just don't confuse it for production deployment

AI in NetOps: More to Consider

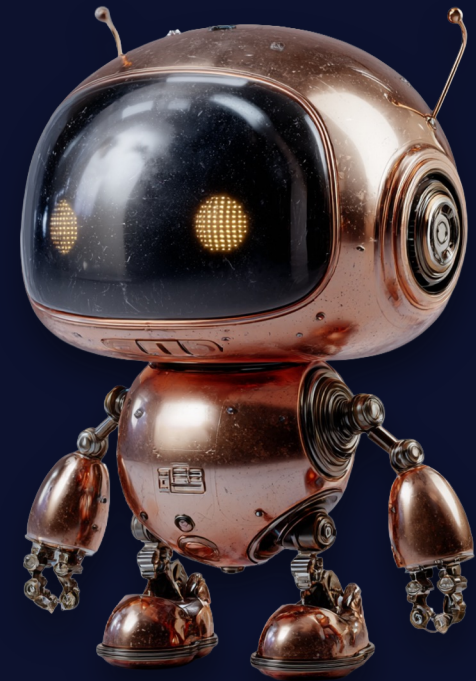
- Do I have to build my own agents, or can I buy them via/within a platform? How should I evaluate and make build vs buy decisions?
- What LLMs (and other types of models) are good for what types of NetOps problems? Again, how should I think about this? (Hint: Ask Eric and listen to TNOps!)
- What's coming with vendor-specific (e.g., NOK/CSCO/JNPR/ANET) models? How would I use them in a mixed vendor environment? How should I train/supplement these models on MY network data (structure, configs, operational data, more)?
- Should I really think of AI netops agents as “digital coworkers”? Why/why not?

Fear versus Possibilities

- Don't just focus on how AI will change what you do – this is easier to see and therefore easier to worry about
- Also think about what it can enable you to do that you can't do today - and this is harder to envision
- Playing with the tech can help you develop the latter view

Are Agents People?

- No (obviously?)
- However, this can be a helpful analogy, from an org, permissions, tools, oversight, and expectations perspective
- Please remember that analogies have limits as you leverage the analogy

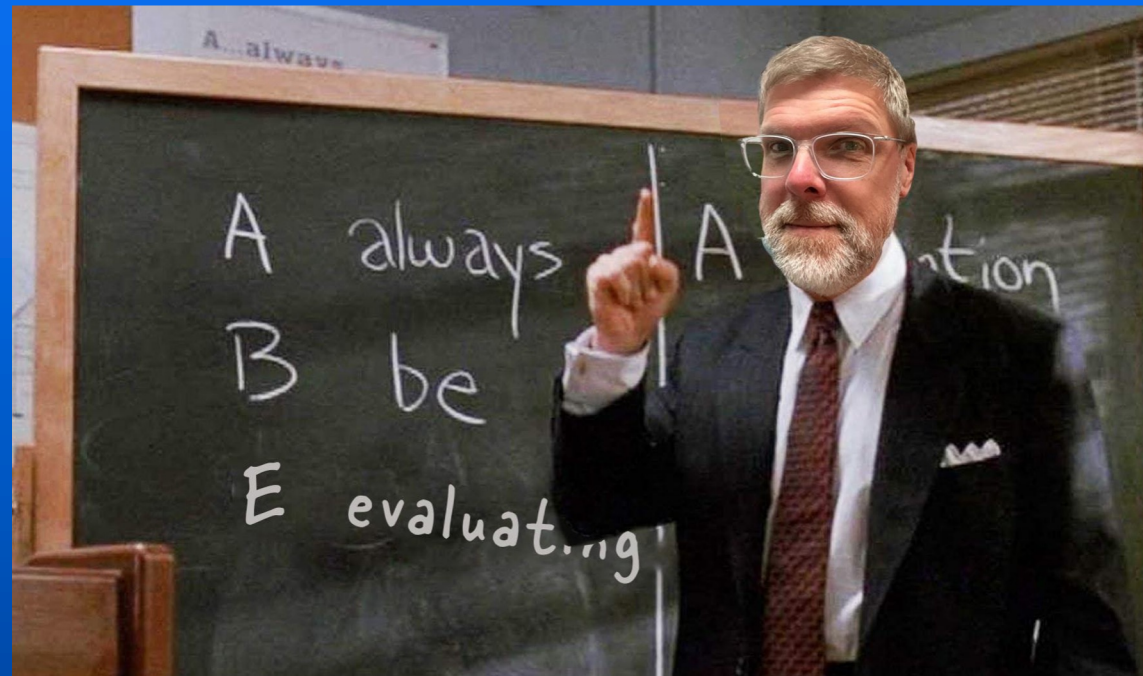


I am not a human.

ABE: Always Be Evaluating

Proactive Technology Evaluation

- Continuous scanning for emerging technologies
- Pilot programs and experimentation culture
- Requirements and POCs
- Small batch changes with measurement



ABE: Drinking my own champagne

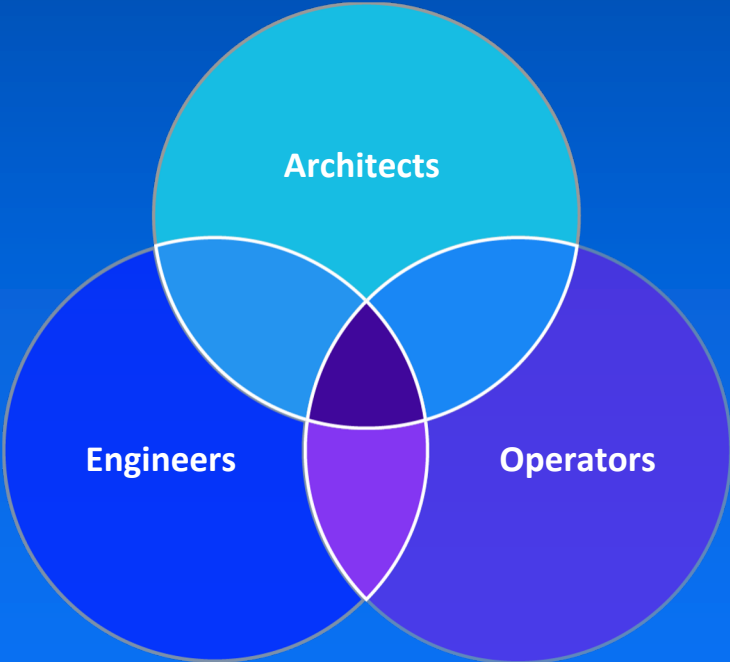
Networking for AI

- Scott's change of thought
- Lossless Ethernet fabric - original thought was "super interesting but will only really impact a few networkers"
- Updated view: still super interesting, and:
 - 1. This may become standard X years downstream (X = 5? 2?)
 - 2. If it draws you in, it will deepen your understanding of today's Ethernet

Quantum computing and networking

- Companies emerging to focus on this: IonQ, others
- NFD story: The patient tutor
- Might be closer to viability than we think
- Good to get your head around qbits and how quantum entanglement works
- Significant Implications for crypto
- What about intersection of AI and Quantum?

The People Plan

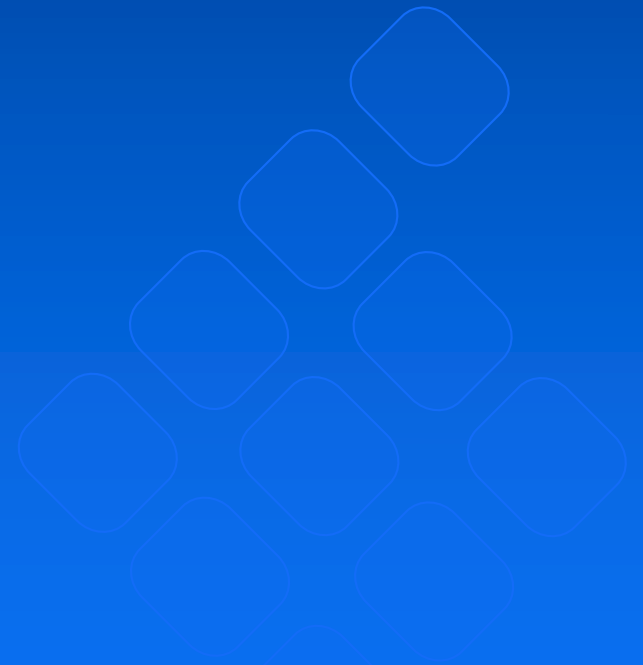


This!



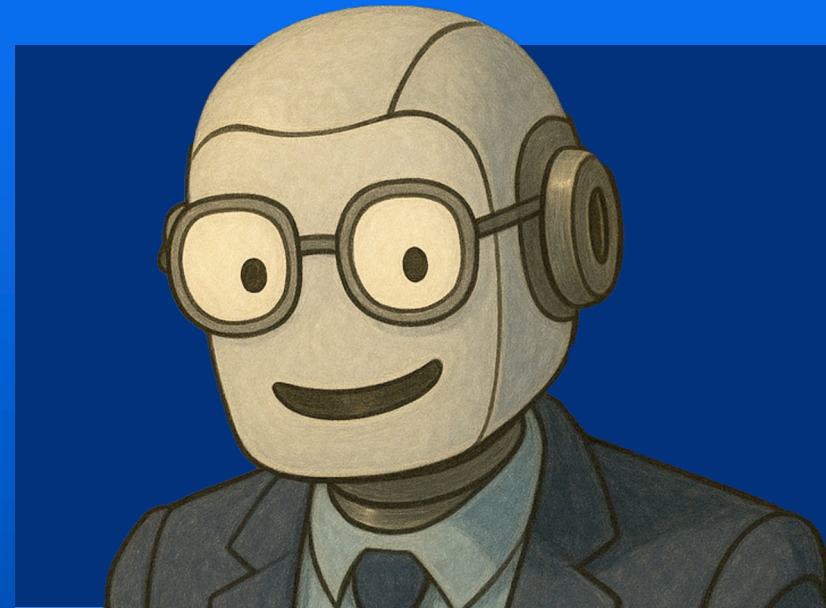
Not this.

Now What?



Next Steps to Becoming a NGNE

- We're in a learning environment that we've never really seen before
 - WWW
 - AI as a Patient Tutor --->
- There is NOTHING in your way – except time as a scarce resource
- Tailor all these topics to your environment
- Consider vendors in place and on the horizon, as well priorities in your NetOps team and what interests you.



YOUR PATIENT TUTOR

Approaches to Using NGNE Learning Roadmap



Go Deep

- Use the above learning roadmap laid out as-is
- This works well with the topics listed in NGNE Levels 100-300
- *Option:* Cover a smaller number of subjects at a time



Go Wider

- Overviews of more topics at a time
- Focus on overviews of the topics and come back to each one for more depth as needed or as interest dictates



Triage

- Do what you need to do
- Dive into the things you need to know first in any of the levels, driven by your job or by your curiosity

Other Helps for NGNE Study

Study groups

- Getting together with one or more other people with similar interests can be really helpful
- Organizations, podcasts, and individuals that can help specifically with learning in groups
- Reach out to people you know in similar circumstances – find Birds of a Feather
- Orgs: WireShark, NAF, USNUA NUGs, NANOG, Wi-Co, Meetups
- Podcasts: Packet Pushers (N is for Networking), AONE, Telemetry Now
- Slack/Discord: see orgs above

Set priorities and start somewhere

- Work through the topics in a way that balances your work needs, the time you have to study, and what interests you the most

Continual NGNE Evolution

A year from now, it's almost guaranteed that something in this list WILL change...

Recall the reality of tech disruption

- MCN seems to be waning, Kubernetes may take over the world, WebAssembly could gain huge momentum, and other topics that aren't even on our radar yet will emerge

TNOps discipline of continual evaluation will help you evaluate what's important as a NGNE

- To your org
- To your own skillset and career

Change Beyond Personal Skills: Org Evolution

- NGNE is all about personal focus on skills development
 - That's good and necessary (and awesome!), but not sufficient
- There needs to be engagement with NetOps org leaders to turn the ship
 - This is challenging
 - Complement and support grass roots efforts
 - This is what we want to do with TNOps



NGNE: To Sum it Up



Disruption is here to stay
Personally and organizationally



We CAN elevate NetOps
Personally and organizationally



**You can learn anything you put
your mind to**
Keep Learning!

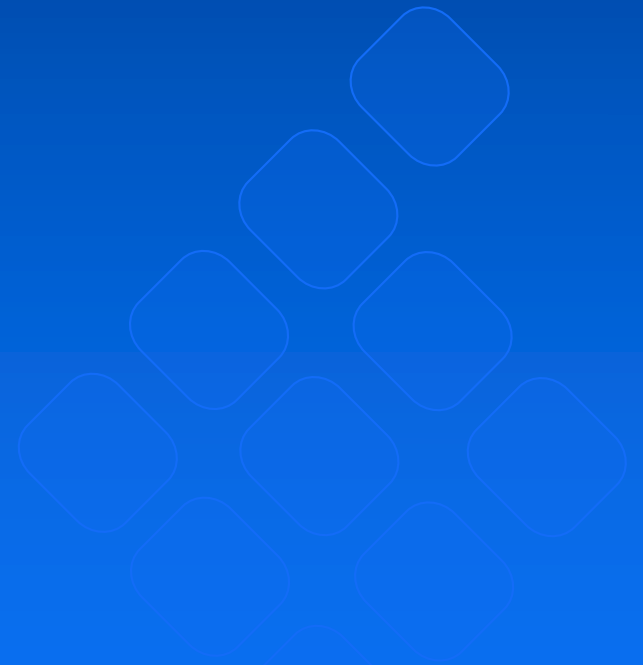
TNOps can help!

What's Next: TNOps and NGNE

- Keep talking to and learning from operators
- Keep talking to vendors to cultivate Ops focus
- Create and curate useful materials and resources – including NGNE learning path
- Engage with companies that want to do NetOps Better
- Please send good people our way
- Please listen and provide feedback:
<https://packetpushers.net/podcast/total-network-operations/>



Questions/Discussion?



Thank You!

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