

Infrastructure That Explains Itself

Bringing Containerlab to
Life with Python and AI

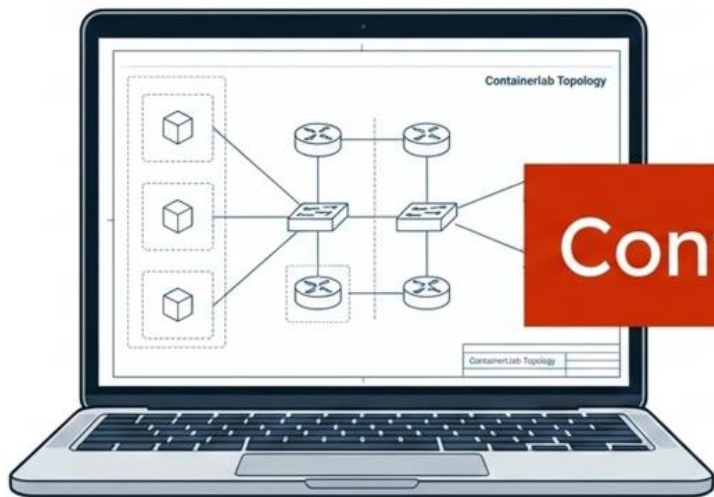
(NE)NUG

Nebraska Networking User Group

Tim Bertino

Why Do We Build Labs?

Confidence Before Production



Confidence



There is Another Option

TRADITIONAL LABS



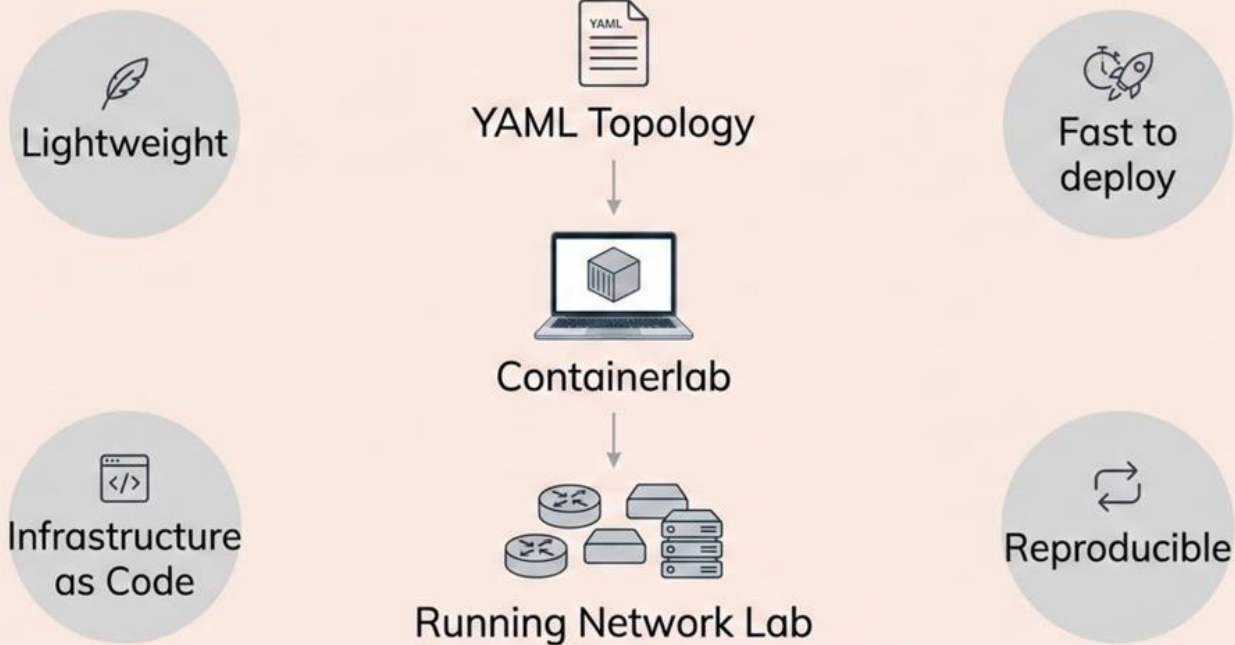
- Rack hardware
- Multiple virtual machines
- Higher cost
- More setup

LOWER BARRIER



- Containers
- Faster setup
- Easier to iterate

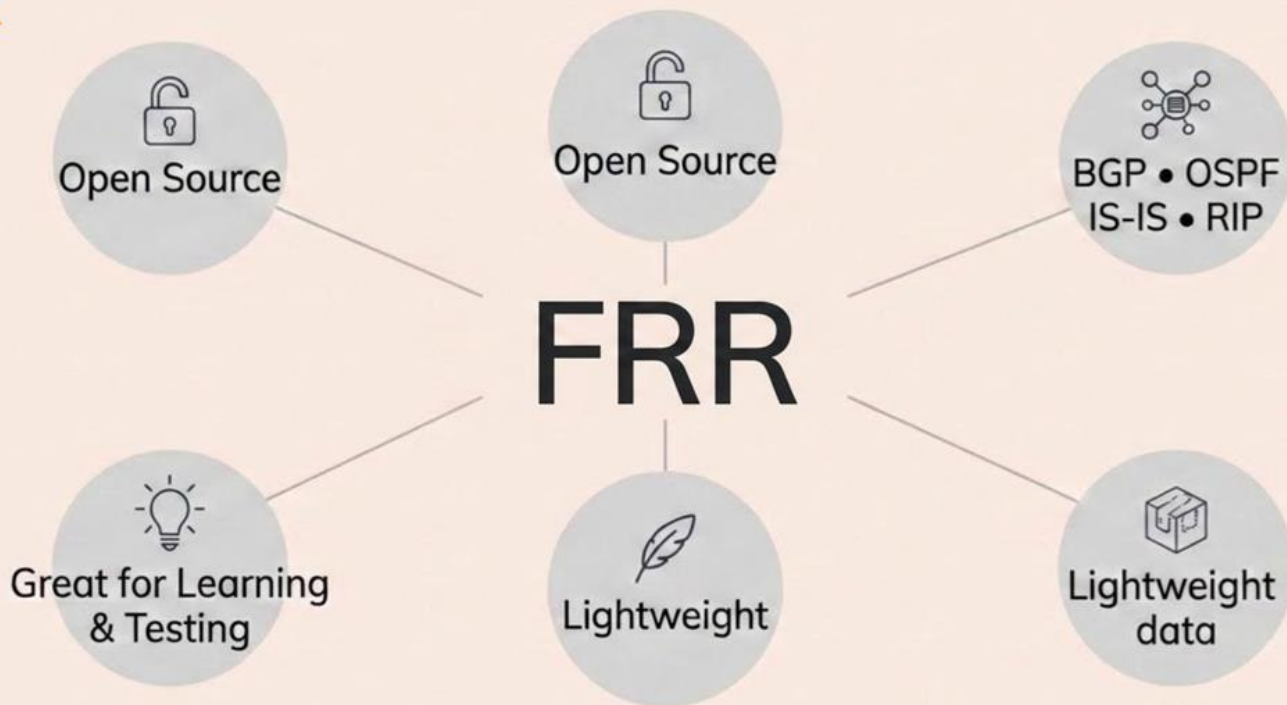
Containerlab - Infrastructure as Code for Network Labs





FRRouting

A free, open-source routing suite



Logs on Logs on Logs

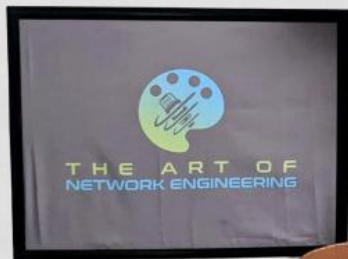
```
[2024-05-20 14:32:01.001] INFO OSPF: Adjacency formed with 10.1.1.254 on eth0
[2024-05-20 14:32:01.001] INFO OSPF: Adjacency formed with 10.1.1.254 on eth0
[2024-05-20 14:32:01.001] INFO BGP: Session down with 192.168.10.1 (bgp_peer_check: connection reset by peer)
[2024-05-20 14:32:01.001] INFO BGP: Session down with 192.168.10.1 (bgp_peer_check: connection reset by peer)
[2024-05-20 14:32:01.001] WARNING BGP: Session down with 192.168.10.1 on eth0
[2024-05-20 14:32:02.002] INFO BGP: Session down with 192.168.10.1 on eth0
[2024-05-20 14:32:02.001] INFO BGP: Session down with 192.168.10.1 on eth0
[2024-05-20 14:32:02.002] INFO BGP: Session down with 192.168.10.1 on eth0
[2024-05-20 14:32:02.003] INFO BGP: LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.004] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.005] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.005] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.005] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.006] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.007] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.009] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.008] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:02.008] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:02.010] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:02.912] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:02.911] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:03.922] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:03.983] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:03.921] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:03.922] INFO IS-IS LSP received from system 0000.0000.0001
[2024-05-20 14:32:01.001] INFO FRR: Startup annwatched with 10.10.154.1000.0001 on eth0
[2024-05-20 14:32:01.001] INFO OSPF: Adjacency formed with 10.1.1.254 on eth0
[2024-05-20 14:32:01.001] INFO FRR: Startup sequence initiated...
```

Cognitive Load



Understanding shouldn't require assembling a puzzle.

Why I Built NetCanvas



Wanted to Build a Lab



Couldn't easily explain it

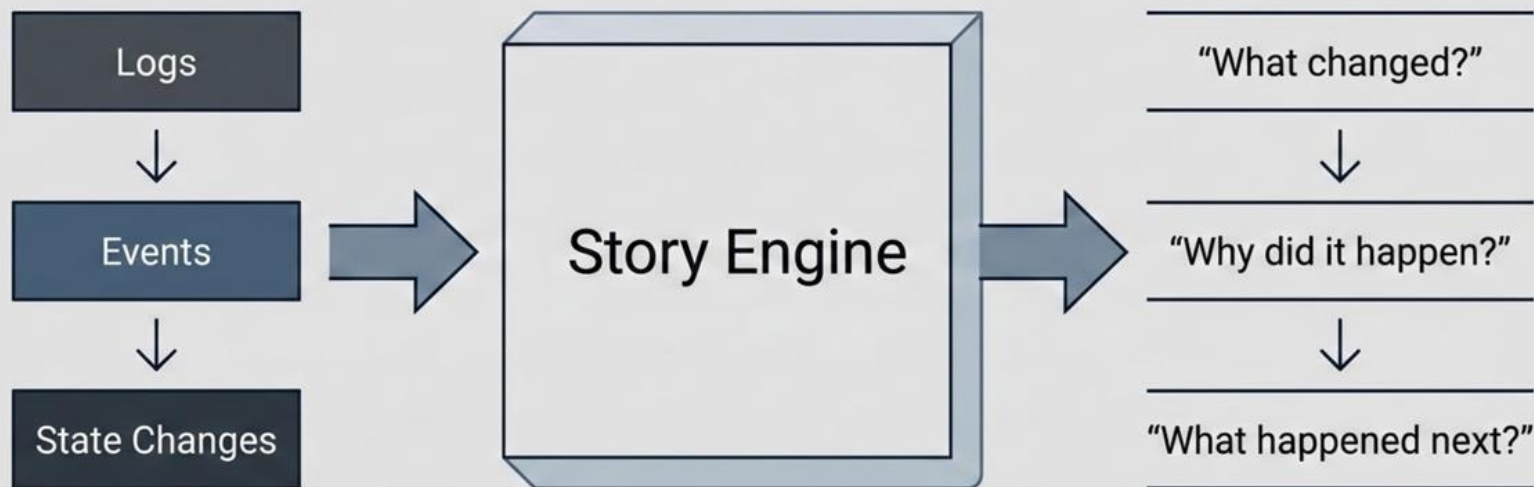


Started building NetCanvas

Engineering starts with curiosity.

Story Engine

Turning network events into understanding.



What You're About to See



Build



Observe



Fail



Explain

Watch the network tell its story.

Okay... what just happened?

The network changed



The network reacted



The network explained why

Lessons Learned



Build Labs



Lower
Barriers



Automate
Repetition



Reduce
Cognitive
Load



Build What
You Need

Engineering Removes Barriers



Containerlab

Makes labs reproducible.



Python

Makes labs automated.



AI

Makes networks easier to understand.

So...

What's the next thing
you're going to build?