

Building Community Owned Critical Infrastructure

\$ whoami

Matt Griswold

- Started in the internet industry end of the 90s, mostly coding (in C)
- Moved to Chicago ~2005, built a couple futures trading companies
- Founding director of PeeringDB, helped establish it as an independent Non profit organization
- Served on many Non profit boards
- Created and built out United IX / Chicago Internet Exchange
- \$dayjob focused on AI tooling and infrastructure at scale
- volunteering on Open Pipes and Global Peering Forum

What will we talk about?

- Community owned critical infrastructure
- Our model, allowing community governance
- Knowledge base and practical application
- Use ours, or leverage it to make your own
- What we're doing in Chicago right now

Deja Vu?

I did start one other IX in Chicago and talk about it at CHINOG,

<https://chinog.org/wp-content/uploads/2015/05/Middle-Out-Automation-Automating-an-IXP.pdf>

Why?

Critical Infrastructure is too important

Regardless of the current owner, if it's commercial, it can change too easily

I used to argue private ownership was better for initial control, *I was wrong.*

Trip down memory lane

NLNOG Infrastructure started here at Pepper Canister during NANOG67

Up and Running by NLNOG Sept 2016

https://nlnog.net/events/past-events/nlnog-day-2016/presentations/7_NLNOG_infrastructure.pdf



FUN FACT · BONUS STAGE

Won **157.97.97.0/24** for 1st at The Merciless NLNOG Quiz.

Commercial ownership **permits**
operator and member
incentives to diverge.

It's not easy making an IX

- No one wants to be the first network, or the second
- It's a lot of real work doing logistics, promising value, and delivering

An IX is sticky

Cross-connects

BGP sessions / Route policy

Meaningful traffic

Peering relationships

Capacity plans

Operational trust

By design. *A fabric you can leave casually isn't doing its job.*

IX redundancy is good

DIVERSITY

Operators

Facilities

Paths

BONUS

New peers

Peer overlap is redundancy

Maintenance drain is “free”

Connect to multiple IXes. Regardless of who runs them.

Open Pipes Non Profit Design

Global organization umbrella

Handles legal and taxes

501(c)(3) filed

Setup to help communities and allow self governance

Protect assets as fabrics change

What that means, **structurally.**

ASSETS

No Wind down

No wind down unless the fabric isn't being used

GOVERNANCE

Community driven

The networks plugged in vote on the future of the fabric. Voting structure being finalized.

SURPLUS

Stays in the fabric

No dividend stream. Money earned at the fabric pays back into the fabric.

How: Governance stays local

local region creates self governing committee

No extra overhead for taxes, filing

Keeps the building local with network engineers

Neutral body to separate from local DCs

*lots of people have expressed interest, *not proven yet*

When? Where?

Here. Now.

Carrier and data center neutral. Community governed. Now live in Chicago!

Four facilities

CH1 · DRT MMR

350 E. Cermak Road

2nd Floor · Chicago, IL

CH2 · CORESITE CH1

427 S. LaSalle St

BMMR · Basement · Chicago, IL

CH5 · EQUINIX

350 E. Cermak Road

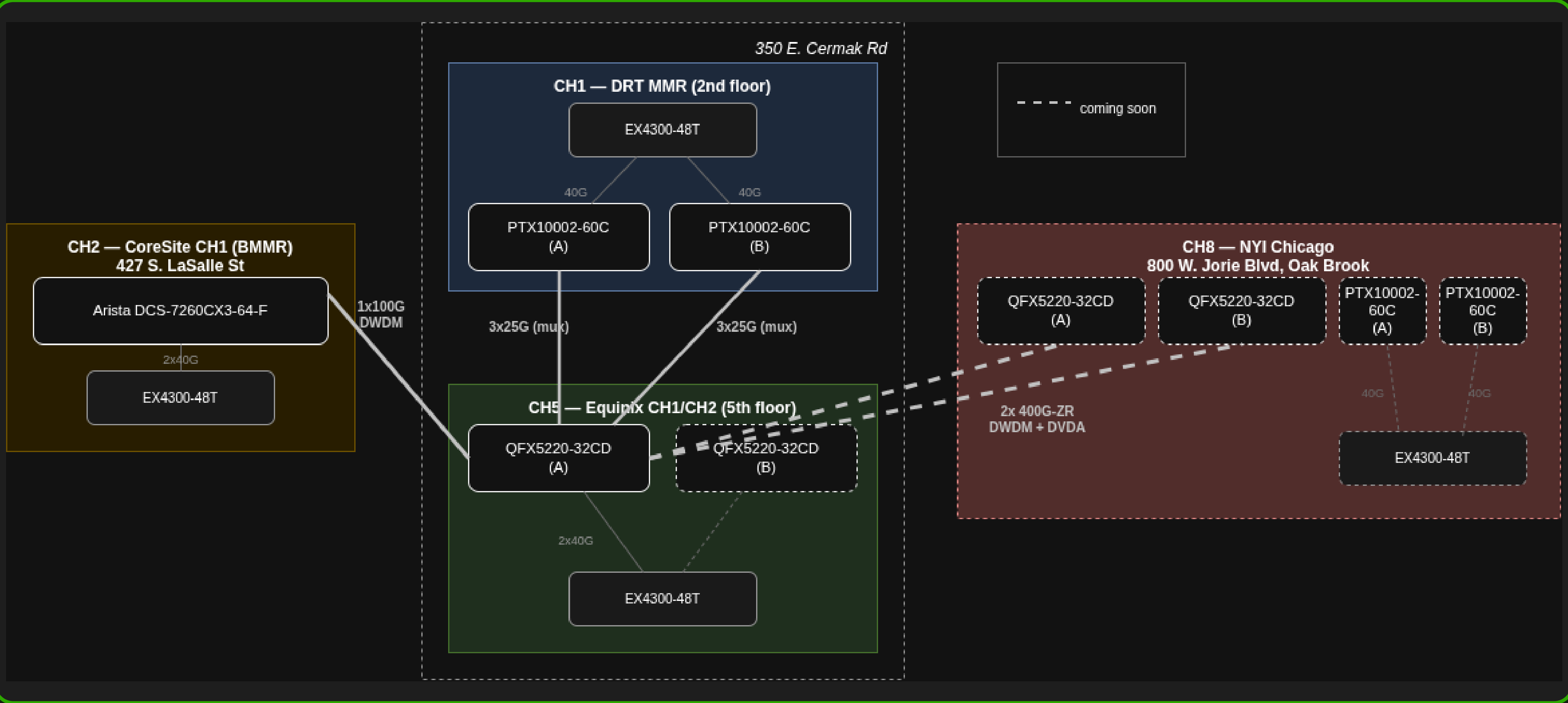
5th Floor · Chicago, IL

CH8 · NYI CHICAGO

800 W. Jorie Blvd

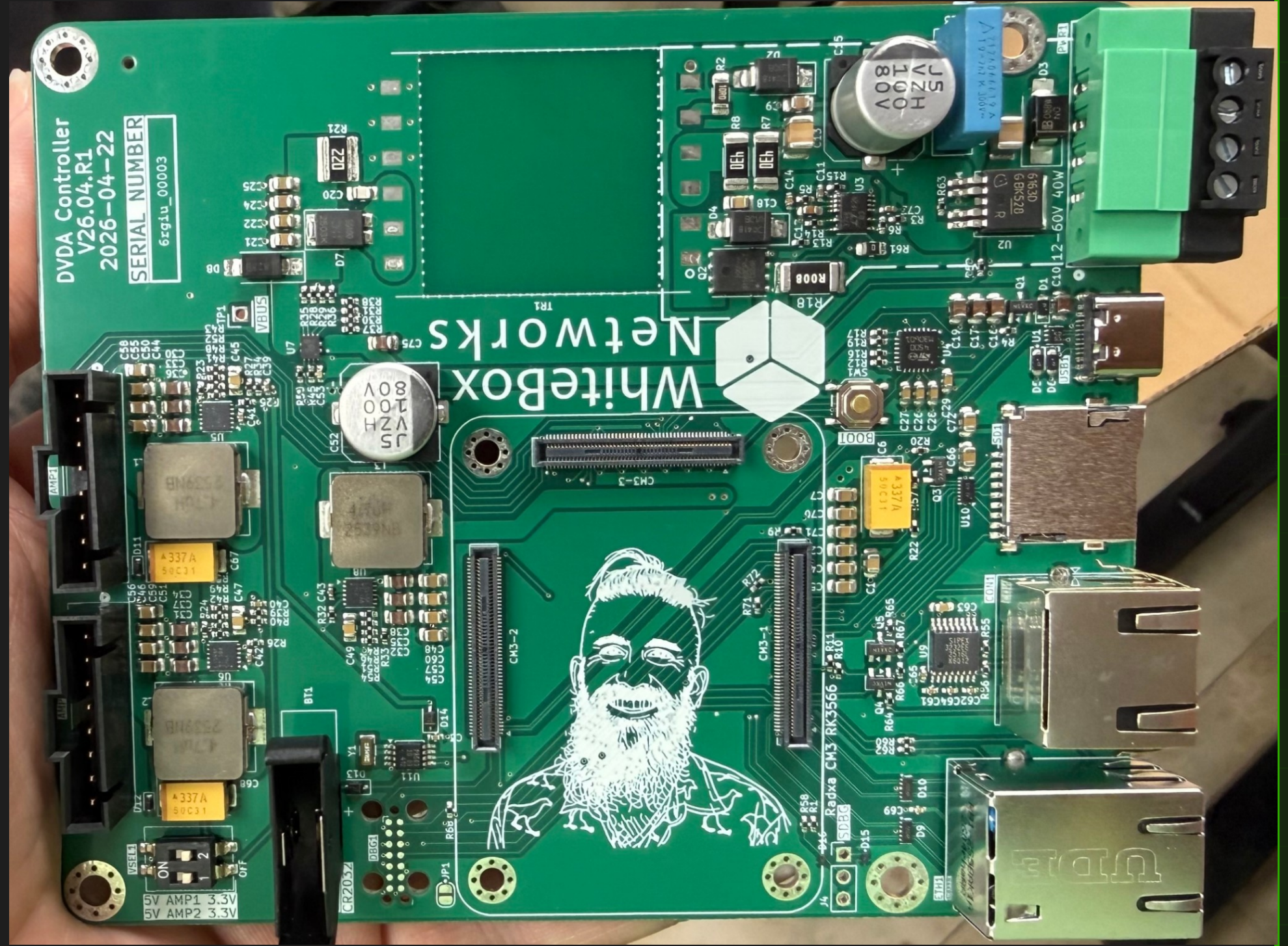
Oak Brook, IL

Topology



New Amps

- Low Cost
- Dual EDFA Amp
- Built for Open Pipes



Out of Band

- Isolated per pop
- OpenWRT (GL-MT3000)
- LTE, WIFI, ETH
- Serial + ETH mgmt
- Wireguard phone home



L3 services

INTRA-IX

Connections between fabrics

Here's why we have routers

CACHES

Cache services & servers

Provide meaningful traffic from the jump.

TRANSPORT

Transport, etc

Coming soon from local providers.

BUT WAIT, THERE'S MORE?

\$your_service_here

Join the fabric, we have extra VLANs.

Software Stack

FullCtl for automation layer (<https://github.com/fullctl>)

NetBox for DCIM

(<https://github.com/netbox-community/netbox>)

oob is OpenWRT + wireguard

Onboarding

- 1.Add to FullCtl IX
- 2.Email portal link
- 3.Peer

Open Knowledge for Communities

- How and where to start
- Tribal knowledge, documented
- Public, versioned, contributable
- Best Current Operational Practices

<https://openpipes.net/docs>



Questions?

Want to get involved?

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