

# Bridging the Gap: Integrating DDI with NetBox for Modern Network Automation

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## Agenda

- Introducing NetBox & NetBox Labs
- Legacy Network Documentation
- Introduction to a Network Source of Truth (NSoT)
- Network Automation Reference Architecture
- IPAM in NetBox
- DDI Tools and NetBox Integration Patterns
- Q&A

# Introducing NetBox & NetBox Labs

# Everyone uses NetBox



# Commercial Stewards

## Defining Community & Tech

### netbox labs

- Founded in 2023 in NYC
- Commercial steward of NetBox OSS
- World class team built & lead NSI, founded the NetBox project
- World Class investors & customers

FLYBRIDGE

Grafana Labs

Notable.



### Virtuous Circle

NetBox Labs leverages open source to generate commercial value and revenue, and reinvests in the community to create open source sustainability and scalability.



### netbox

- **15K+** Github ★ - Widely loved by networking teams
- **11K+** Software commits - feature complete + rapid development
- **~290** Contributors - core, plugins + integrations
- **1000s** of companies run NetBox in production

# Solving for the Rise in Network Complexity

Documentation & Automation Are Key to Reliability

**65%**

of network changes are performed manually <sup>1</sup>

**78%**

of orgs that have implemented a NSoT believe it is effective <sup>2</sup>

**ONLY**

**27%**

of Network Ops feel they are successful (8% decrease YoY) <sup>3</sup>

<sup>1</sup> Gartner Market Guide for Network Automation Tools

<sup>2</sup> Enterprise Network Automation: Emerging From the Dark Ages and Reaching Toward NetDevOps 2024 —Shamus McGillicuddy, VP of Research, EMA

<sup>3</sup> Network Management Megatrends 2022 —Shamus McGillicuddy, VP of Research, EMA

- Notes
- Design docs
- Spreadsheets
- Git repos
- IPAM tool(s)
- CMDB
- ....ask Kate.....oh...she left last month...!

**Where is the  
Network  
Information?**



- Sites, locations & contacts
- DCIM data (racks, devices, cabling)
- **IPAM data (prefixes, addresses, vlans, VRFs, ASNs)**
- VPN (Tunnels, L2VPNs)
- VM's
- Power
- More...

**What Network  
Data Should  
we  
Document?**



# What is a Network Source of Truth (NSoT)?

- Defines the *intended* state of the network represented as *structured data*
- Should act as a single consistent data set
- Adopting an NSoT requires a significant mental shift for network engineers away from describing the network in design documents and diagrams
- NSoT becomes the authoritative reference for the network and its data *drives network automation*

Inventory

DCIM

IPAM

Configuration

Network Properties

Circuits

# The journey to network automation starts with implementing a NSoT



## Document

- Converge legacy sources of truth
- Discovery or manual capture of additional network data
- Change operational processes to start with documentation



## Model

- Connect network data through cohesive models
- Enforce consistency across models



## Automate

- Implement change management starting with NSoT / intent
- Generate configs from model data
- Drive automations from dynamic inventory
- Assurance to identify/resolve operational drift

1

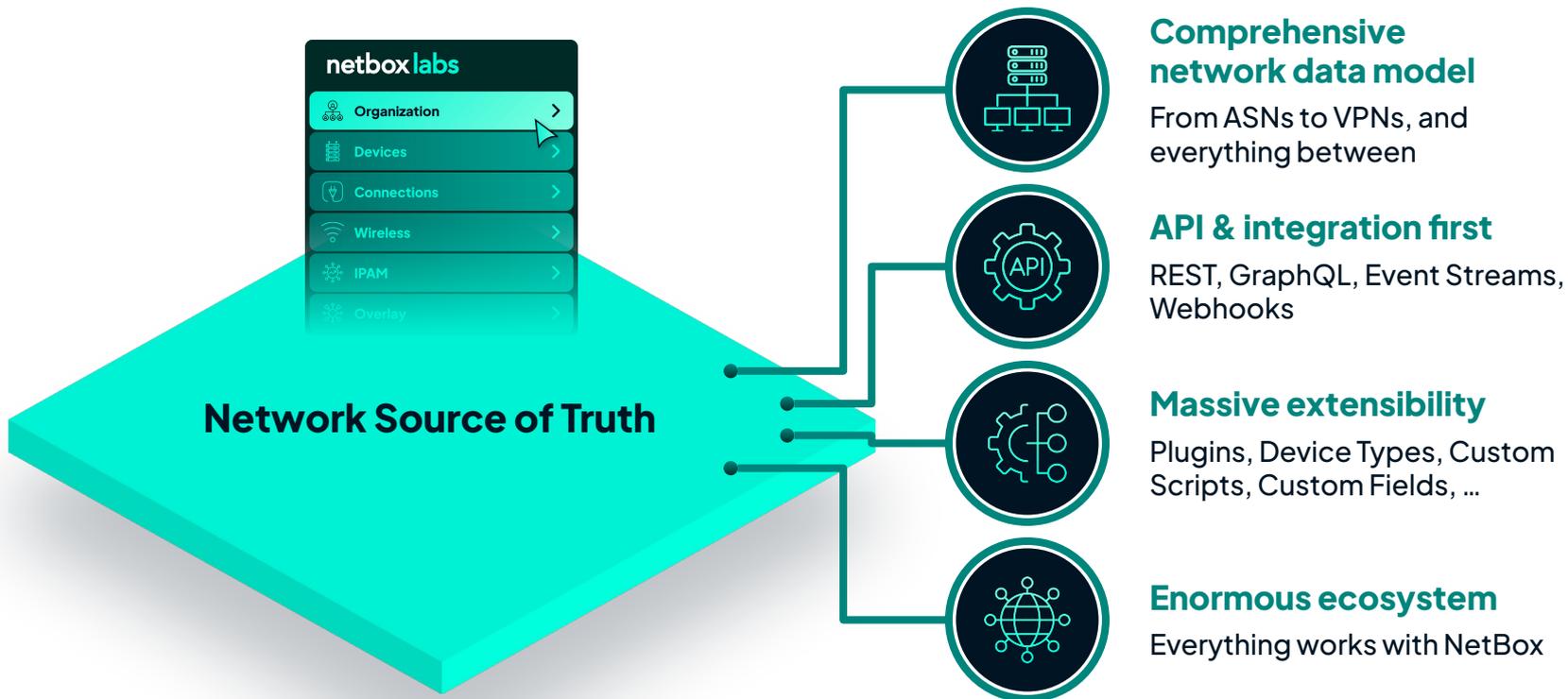
2

3

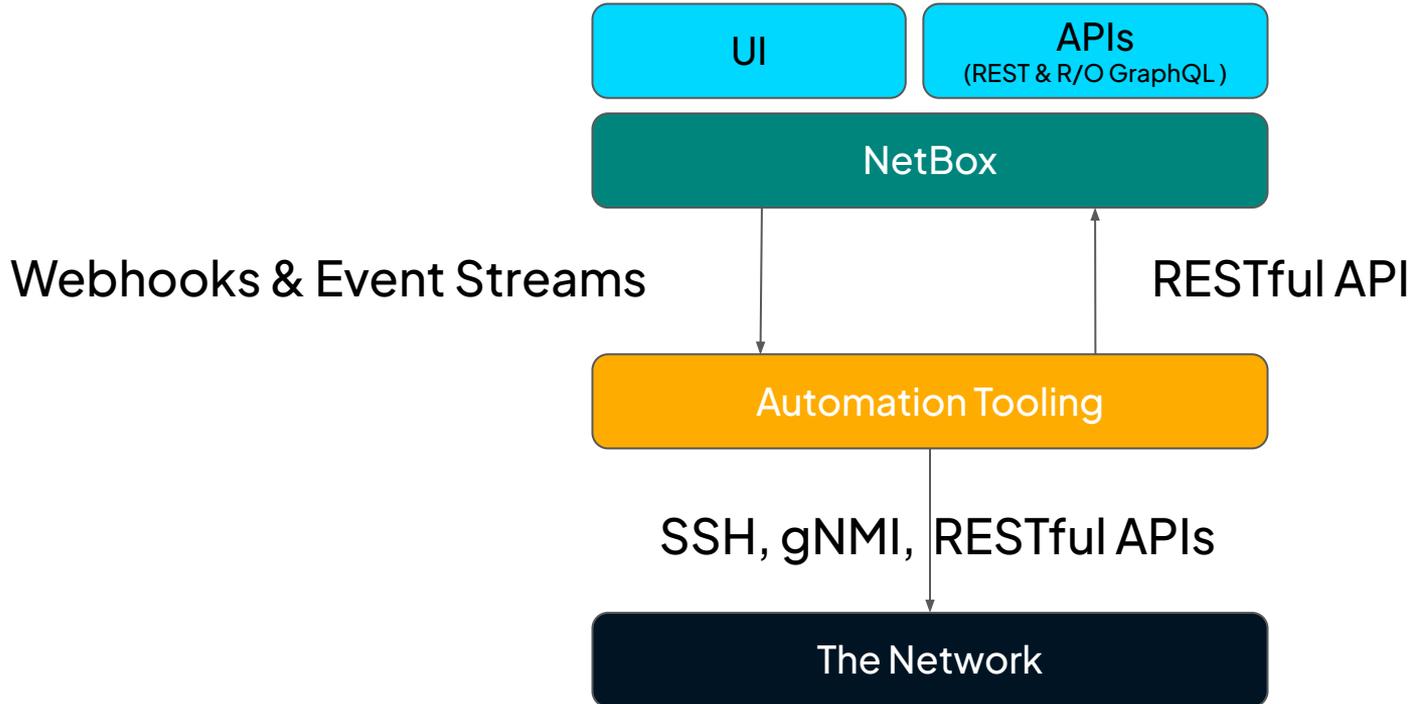
72% of organizations are within these two phases.\*

Only 28% of organizations have fully executed their network automation strategy.\*

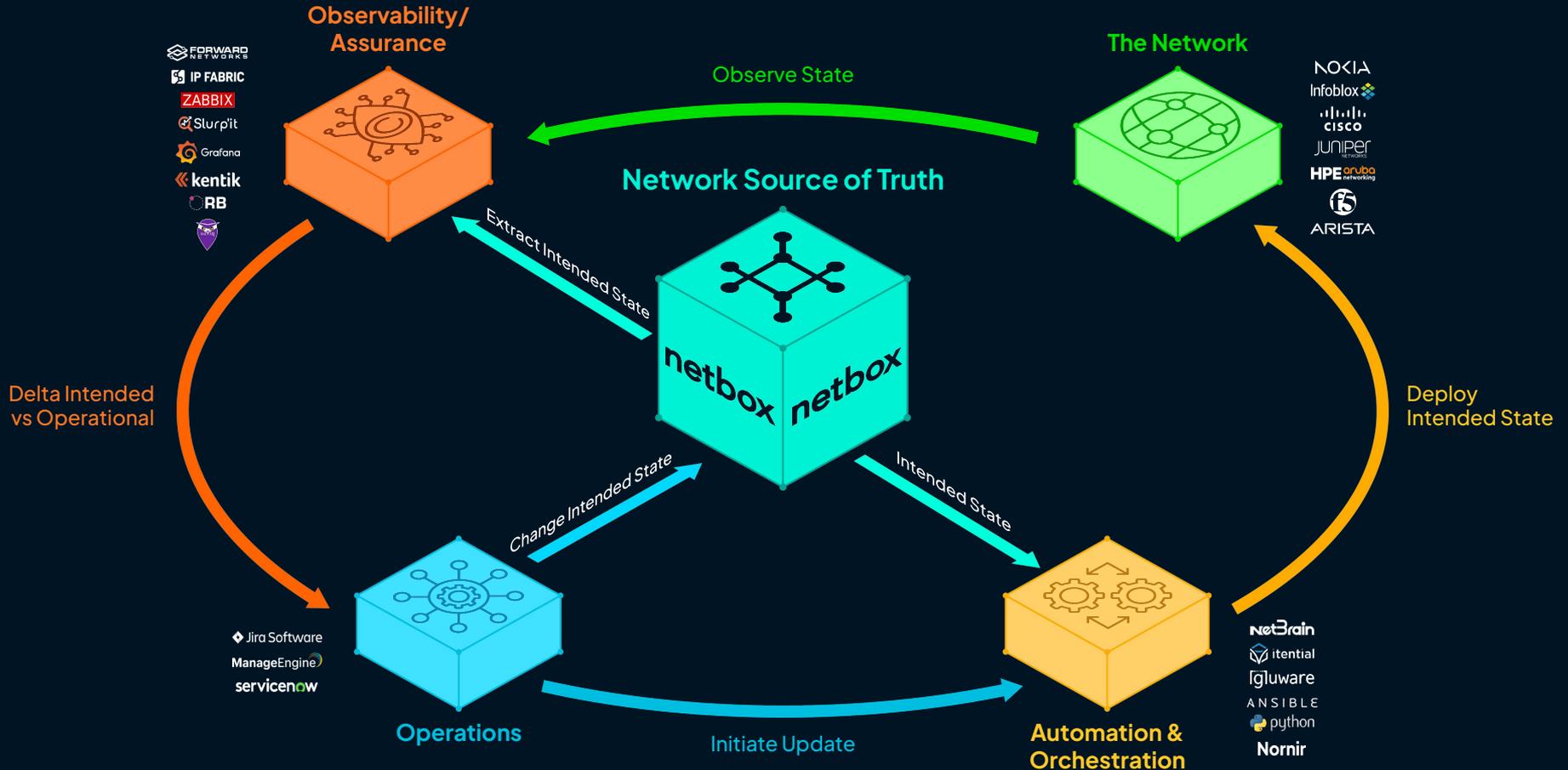
# NetBox is the world's most popular Network Source of Truth (NSoT)



# Getting Data In and Out of NetBox



# Modern Network Automation Architecture



# Which NetBox is Right For You?

## NetBox Community

## NetBox Enterprise

## NetBox Cloud

### Benefits

Open source network source of truth powered by our massive community

Self-managed enterprise grade NetBox, fully supported, advanced integrations & features

Cloud-managed, secure, reliable: all the features of Enterprise, with turn-key operations and scaling

### Deployment Model

Self-Managed

Self-Managed

SaaS

### Day-to-day Operations

Your Team

Your  Team

NetBox  Labs

### Advanced Features

N/A



### 24/7 Support

N/A



### Best Practices Assistance

N/A

### Extended Version Support

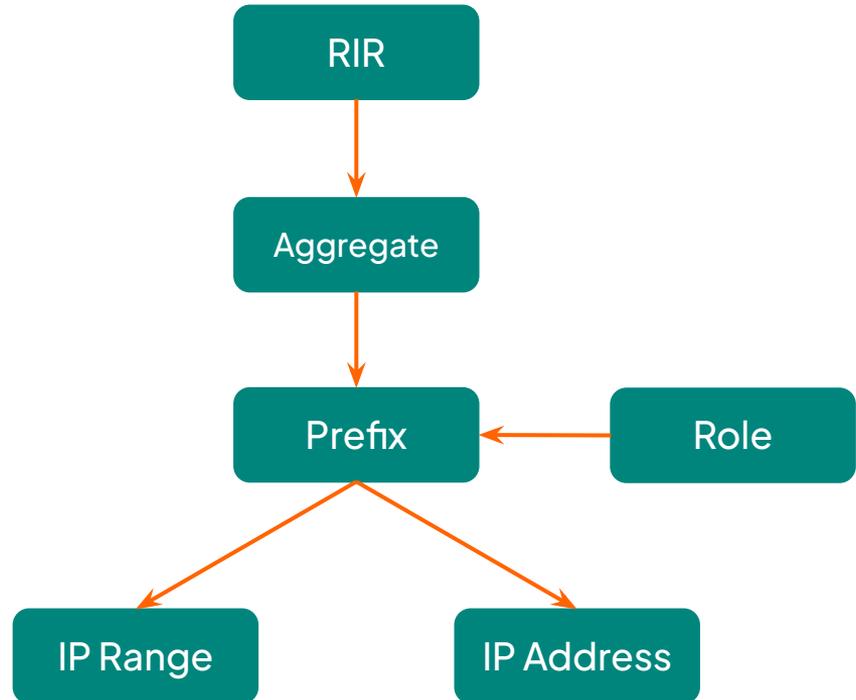
N/A

Up to 2 Years

Up to 1 Year

# IPAM in NetBox

- One of NetBox's core features
- Supports full parity for IP4 and IPv6
- Advanced VRF assignment
- Automatic hierarchy formation, and much more



# IPAM in NetBox – Demo

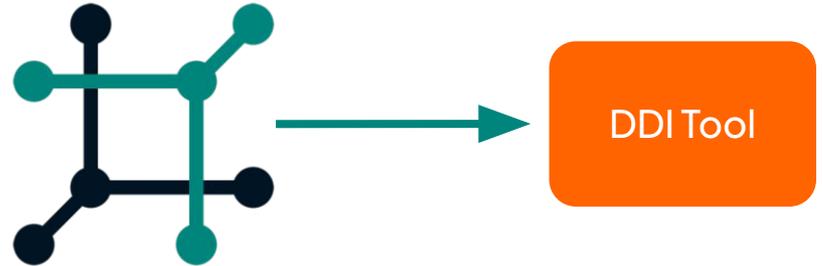
# DDI Tools and NetBox Integration Patterns



# Pattern 1: NetBox is the SoT for IPAM

## Pattern

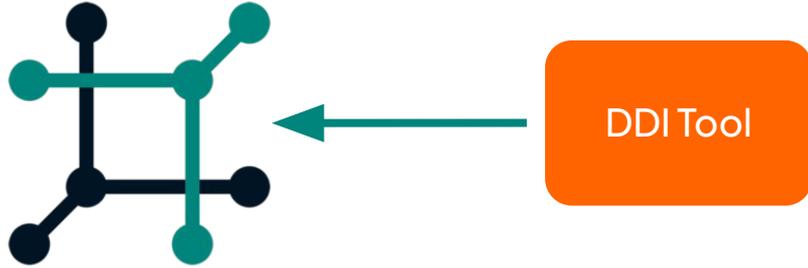
- NetBox plugin or middleware pulls the IPAM data from NetBox
- Data is transformed as needed
- IPAM data pushed into the DDI tool
- Usually a regular sync (not event driven)



## Use Case

- Drive the DHCP+DNS services from NetBox IPAM Data
- Automate in line with automation strategy

# Pattern 2: DDI Tool is the SoT for IPAM



## Pattern

- NetBox plugin or middleware is pulling data from the DDI APIs
- Data is synced into NetBox
- Usually a regular sync (not event driven)

## Use Case

- DDI team (or other users of the DDI) don't want/have to change their processes/tools
- IPAM data is needed in NetBox to drive config generation or other network automation needs

# A 3rd Way: Bi-Directional Sync with Role Delegation (an example)

## Bidirectional Synchronization:

- Data flows in both directions between the DDI tool and NetBox to ensure alignment of IP prefixes, ranges, and reserved addresses

## Role Delegation:

- The DDI tool acts as the authoritative Source of Truth (SoT) for IP prefixes and DHCP services
- NetBox manages fixed/reserved IP addresses (MAC + IP) for devices and operational assignments within those ranges.

## Automation of Address Lifecycle:

- Automate tasks such as:
  - Pulling prefixes and ranges from the DDI tool into NetBox.
  - Pushing reserved addresses from NetBox into the DDI tool.
  - Synchronizing deletions and modifications

## Tagged Range Management:

- Tagging of prefixes is used in the DDI tool define the scope of NetBox's control over fixed addresses

# Help shape NetBox and Infoblox Integrations!

- NetBox Labs are actively working on integrations with Infoblox
- If you would like to get involved help shape the integrations we'd love to hear from you:

[rbibby@netboxlabs.com](mailto:rbibby@netboxlabs.com)

[product@netboxlabs.com](mailto:product@netboxlabs.com)

## On-Demand Webinar – Discover the Power of NetBox for IPAM:

<https://netboxlabs.com/events/webinar-netbox-power-ipam/>

## NetBox Cloud Free plan:

<https://netboxlabs.com/free-netbox-cloud>

## Free NetBox ‘Zero to Hero’ Course:

<https://netboxlabs.com/zero-to-hero/>

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# What Next?



# Q&A

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Thank You!

**NetBox Cloud Free Plan:**

<https://netboxlabs.com/free-netbox-cloud/>

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