PeeringDaysEU ‘25

New and Upcoming NetBox features for IXP/ISPs

Mark Coleman
Chief Evangelist
mcoleman@netboxlabs.com

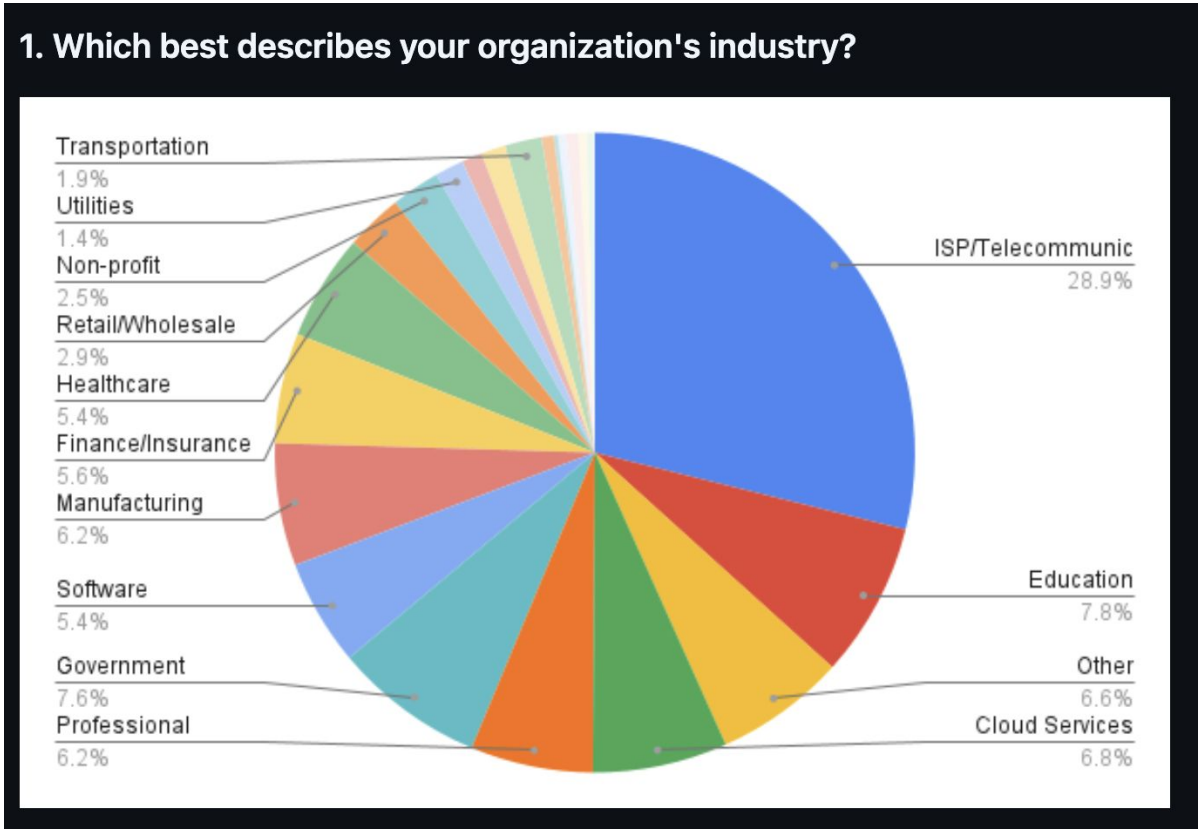
netbox labs

Introducing NetBox & NetBox Labs

Everyone uses NetBox

And 1000s more...

Especially IXP/ISPs



Commercial Stewards

Defining Community & Tech

netbox labs

- Founded in 2023 in NYC
- Commercial steward of NetBox OSS
- World class team built & lead NS1, founded the NetBox project
- World Class investors & customers

FLYBRIDGE · Grafana Labs · Notable. · salesforce ventures · TWO SIGMA VENTURES · FOUNDER COLLECTIVE · ENTRÉE CAPITAL · MANGO CAPITAL · IBM

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

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

In case you missed it

The last 12 months

NetBox Branching – NetBox 4.1 Plugin

What it does: NetBox Branching allows you to make copies of NetBox's data model and alter them independently. Your changes will be reflected only within the branch you're working on, until you decide to merge your branch into the main data model.

Why it matters: NetBox Branching allows you and your colleagues to stage changes within isolated environments and avoid interfering with one another's work or pushing changes to the network prematurely.

Circuit Groups – NetBox 4.1

What it does: Introduces a new object type to group circuits. Circuits can be categorized (e.g. by purpose or region) and assigned priorities within a group. This helps model relationships like primary/backup links.

Why it matters: Easier capacity planning and redundancy mapping for numerous leased lines or peering links. You can instantly see groups of related circuits and their failover order, critical for network resiliency.

Rack Groups – NetBox 4.1

What it does: Adds a rack type object to define standardized rack specs (height, width, weight capacity, rail numbering, etc.) for equipment racks. New rack instances auto-populate these attributes by selecting a type.

Why it matters: Many IXPs/ISPs manage equipment across data centers. Standardizing rack definitions ensures consistency when documenting PoP sites or colocation facilities. It streamlines planning for space and power by using predefined rack templates.

Nested Device Modules – NetBox 4.1

What it does: Enables nesting of device modules (e.g. line cards containing sub-modules) in the hardware inventory. For example, a chassis router's FPC module can contain multiple PIC sub-modules, accurately reflecting the physical hierarchy.

Why it matters: Providers often use high-density chassis (routers, DWDM gear) with complex module layouts. This feature lets you fully model those multi-level components (chassis → line card → module) in NetBox, which was not possible in earlier versions.

Virtual Circuits (L2VPN) – NetBox 4.2

What it does: Extends the circuits model to include “virtual circuits” on top of physical links. You can document point-to-point or multipoint logical circuits (e.g. MPLS L2VPNs, VXCs, VPLS) that ride over physical infrastructure.

Why it matters: IXPs and ISPs deliver virtual connectivity services (like VLAN-based cross-connects or MPLS pseudowires). NetBox can now natively represent those services, linking them to the underlying fiber/Ethernet circuits. This gives a complete view from physical cable to logical customer connection.

Q-in-Q VLAN Support – NetBox 4.2

What it does: Adds support for IEEE 802.1ad Q-in-Q encapsulation. Interfaces can be set to “Q-in-Q” mode, with an outer service VLAN (SVLAN) and inner customer VLAN (CVLAN) defined.

Why it matters: Providers often use VLAN stacking to separate customer traffic. IXPs might tag customer VLANs with an outer VLAN across the exchange fabric. NetBox now lets you document these VLAN mappings natively – which SVLAN carries which CVLAN – improving accuracy in complex Layer2 scenarios.

VLAN Translation Policies – NetBox 4.2

What it does: Introduces VLAN Translation tracking. You can define reusable policies that map one VLAN ID to another on an interface (e.g. translate VLAN 100 to 200 on ingress). These policies can be applied to multiple interfaces.

Why it matters: Some exchanges and providers perform VLAN ID swaps or remapping at network boundaries. Now you can document those translations in NetBox, ensuring that anyone looking at a device interface in NetBox sees if a VLAN is being changed.

Certified Plugin Program: Trusted Extensions for NetBox

What it does: The NetBox Labs Certified Plugin Program vets and approves key plugins for quality, security, and compatibility. Certified plugins are guaranteed to work with current and future NetBox releases and are backed by NetBox Labs support. The Plugin Catalog complements this by listing available plugins and their latest compatible versions.

Why it matters: Many ISPs and IXPs rely on NetBox extensions for critical functions—like BGP session tracking, ACL management, DNS integration, or tenant-specific workflows. But using third-party plugins in production used to be risky: no guarantees of maintenance, upgrade compatibility, or code quality. Certification solves this.

BGP Session Management – NetBox BGP Plugin

What it does: A community plugin (now NetBox Labs Certified) to model and manage BGP data in NetBox. It adds native objects for BGP sessions, autonomous systems, communities, routing policies, and IP prefix lists.

Why it matters: Peering and routing policies are core to IXP/ISP operations. The BGP plugin lets you record which BGP sessions exist on which routers/ports, track import/export policies, and even store BGP community values in your source of truth. This augments NetBox from just physical/logical data to also hold routing intent.

NetBox Discovery – December 2024

What it does: A community available agent that can automatically discover networks and devices, feeding that data into NetBox via Diode. Agents can be placed in various network segments to gather device inventory, IP/MAC data, and topology, rapidly building out NetBox's database.

Why it matters: Populating a source of truth manually in large networks is time-consuming. NetBox Discovery accelerates documentation by autodiscovering switches, routers, subnets, etc., across your infrastructure. ISPs with many sites or an IXP with many member connections can use this to ensure NetBox reflects reality (devices, links, IPs) with minimal manual effort.

Looking ahead

The next 3 months

NetBox Assurance – Drift Management

What it does: A forthcoming NetBox Labs product focused on operational drift. It continuously compares the intended network state (NetBox's data) with the actual live network state from NetBox Discovery agents to flag deviations.

Why it matters: In dynamic networks, especially at scale, networks can drift (ports reconfigured, VLANs changed without documentation). NetBox Assurance will expose such mismatches to teams in real time, so you can remediate before they cause outages or security issues. For an IXP, this might catch an interface that was supposed to be disabled or an unauthorized peering session; for an ISP, a rogue device or incorrect routing setting.

Controller Discovery Integrations

What it does: NetBox Labs is building native integrations to sync data with popular network controllers and cloud IPAM – all leveraging the NetBox Discovery agents. These include: **VMware vCenter**, **Cisco Catalyst Center**, **Juniper Mist**, **Microsoft DHCP**, **AWS VPC IPAM** and **many more** and you can **add your own**.

Why it matters: These integrations break down data silos. Large network ops teams often use specialized systems which are now unified into one source of truth. For example, an ISP running VMware for NFV can trust that NetBox knows about new VMs or virtual switches as soon as they're created.

Custom Objects

What it does: Allow users to define entirely new object types in NetBox without writing a plugin. Similar to custom tables in other systems, you could create a custom model via the UI or API, complete with custom fields, relationships, and APIs. For example, an IXP could introduce an object type for “Peering Exchange Point” or an ISP could add a “Fiber Splice” object, if it’s not in core.

Why it matters: Custom Objects will let organizations extend NetBox’s data model to fit niche needs (like tracking regulatory info, maintenance contracts, or any domain-specific resources) within NetBox itself. This is especially useful for ISPs/IXPs who often have unique operational data (exchange policies, specific equipment trackers) – they can keep that in the source of truth rather than in spreadsheets or custom apps.

What Next?

- **Come and say hello** – if anything I mentioned sounds like it might help you manage your networks, I'm here for questions
- **Subscribe to the newsletter** – For announcements about the upcoming roadmap items: https://netboxlabs.com/newsletter/
- **Sign up for the NetBox Cloud Free plan:** https://netboxlabs.com/free-netbox-cloud/
- **Join the #isp-telco-wg** – working group Slack channel: https://netdev.chat/

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Q&A

CONTACT US

Product Team
product@netboxlabs.com