CHICAGO
MARCH 4-7

INTERNET2
2024
COMMUNITY
exchange

The Insight Console:

Update on current status and work in progress.

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- Insight Architecture
- Insight Console
- Virtual Networks
- The Migration (Oct 2023)
- Since Then

The Insight Architecture

The Insight Architecture

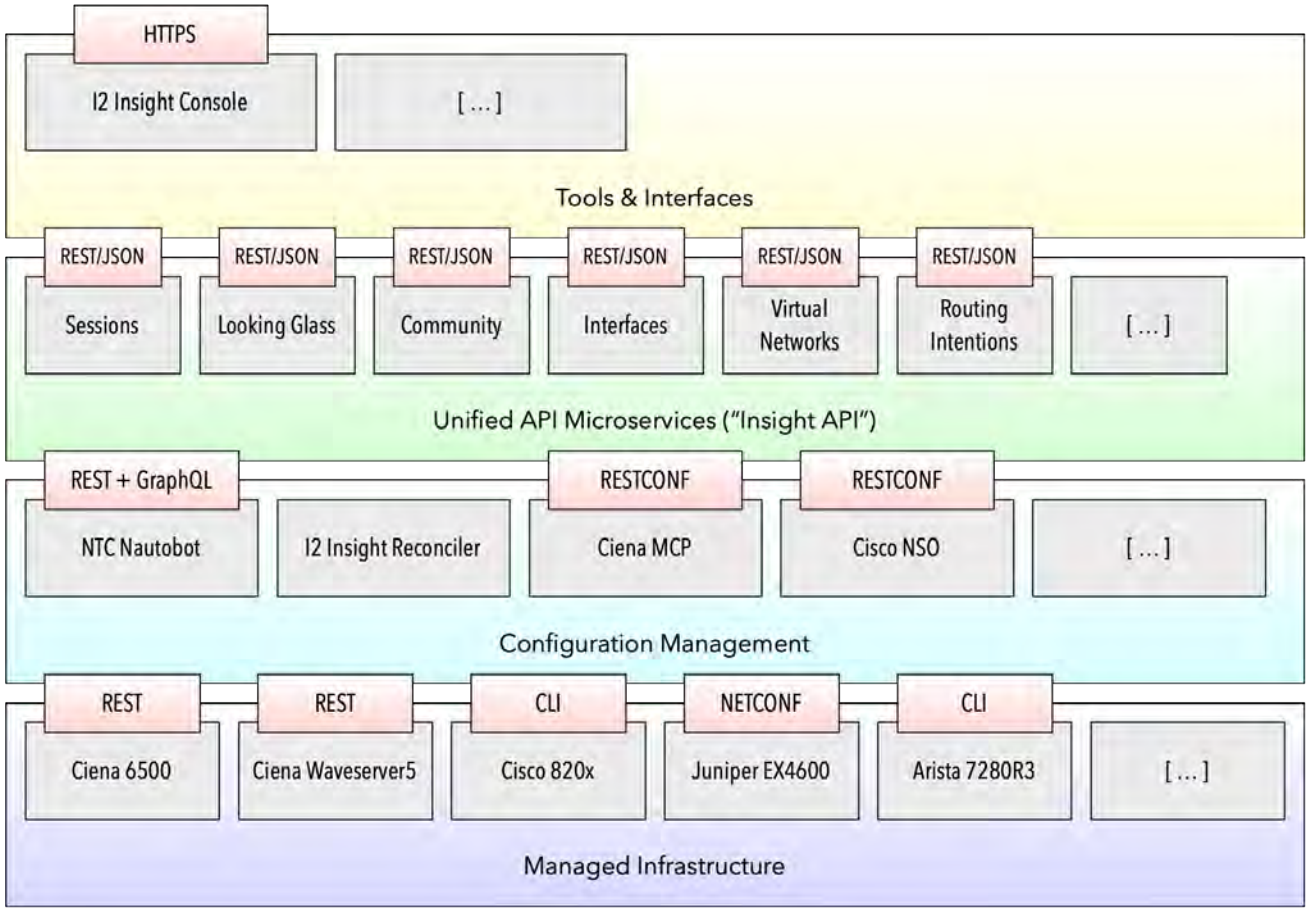
- The Insight architecture is **layered**, **extensible**, and **microservice**-based.

- **Managed infrastructure**:
  - Optical and packet gear in the Internet2 core network.
  - Multi-vendor: Ciena, Cisco, Juniper, and Arista.
  - Other devices types can be added in the future.

- **Configuration management**:
  - Applications providing modeling and automation for managed infrastructure.
  - Includes off-the-shelf (Ciena MCP, Cisco NSO) products as well as customized open source (NTC Nautobot) and locally-developed code (Insight Reconciler).
  - Other applications can be added in the future.

- **Unified API microservices ("Insight API")**:
  - A locally-developed API providing unified, functional, vendor-neutral access to configuration management.
  - Other microservices can be added in the future.

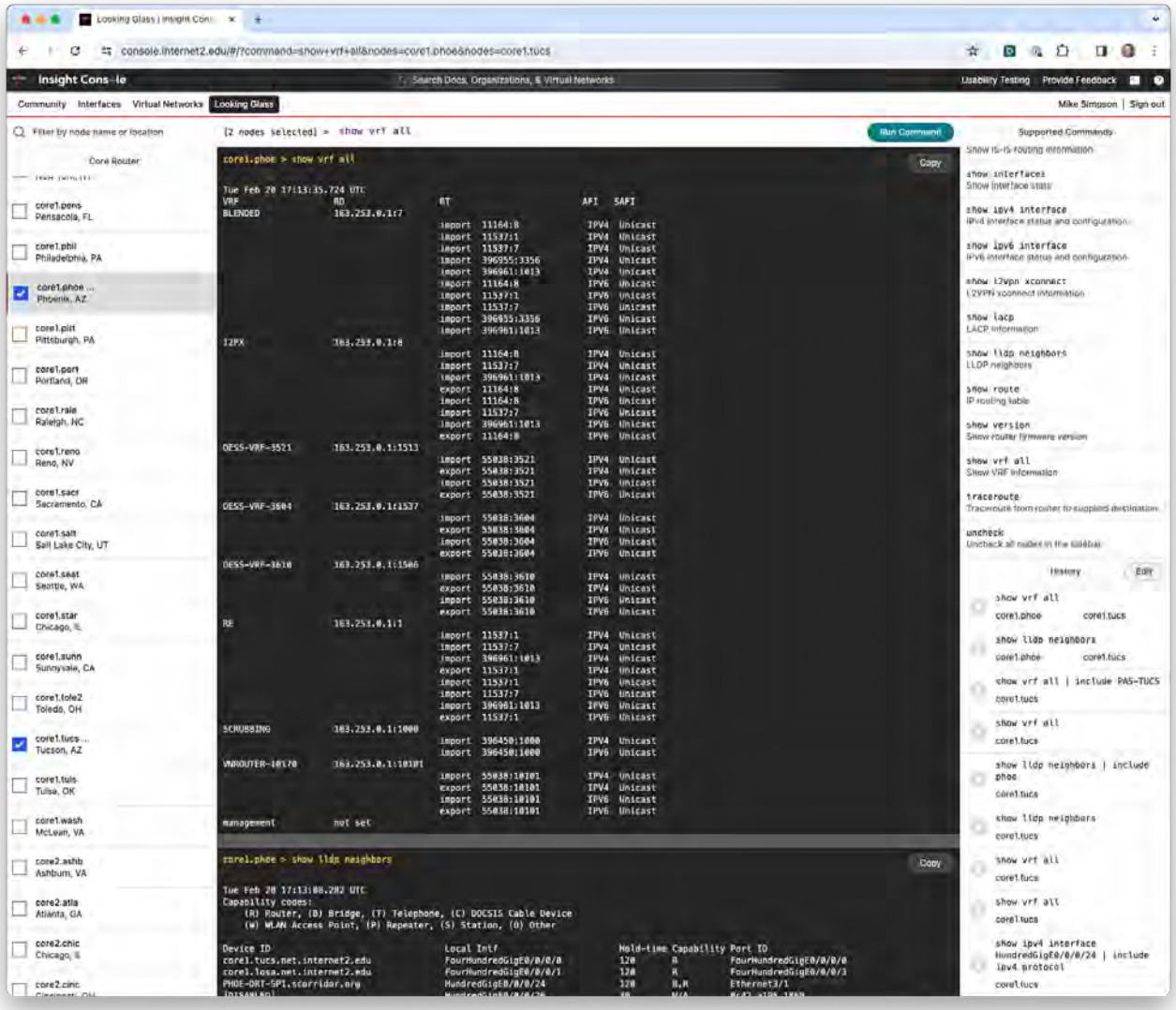
- **Tools & Interfaces**:
  - Currently includes the Insight Console (more later).
  - Other tools can be added in the future.



The Insight Console

The Insight Console

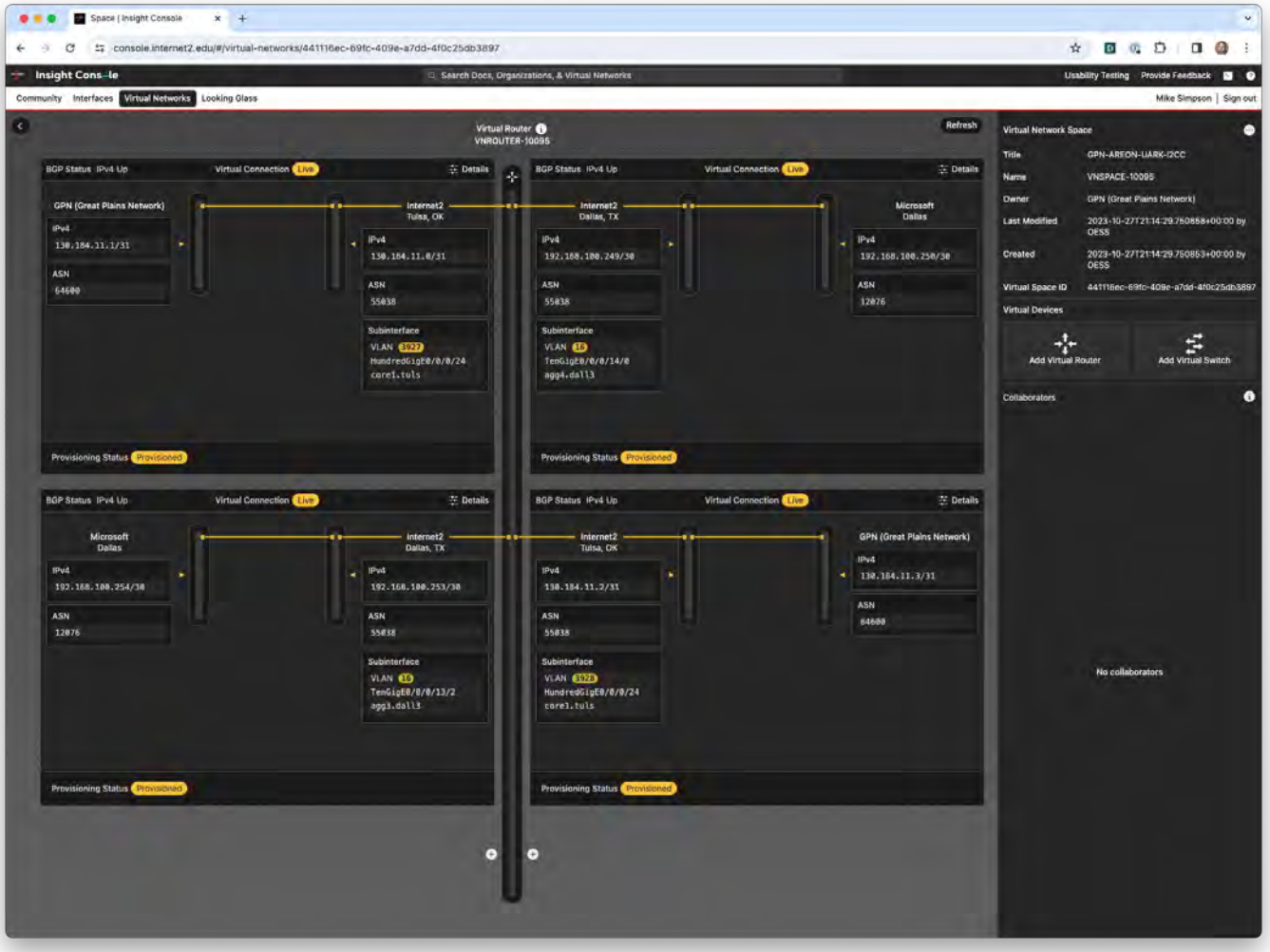
- A web-based tool for **visualizing**, **managing**, and **troubleshooting** all Internet2 **network services**.
- The most visible part of the **Insight** architecture.
- Authentication and authorization integrated with **Internet2 Identity Services** (a.k.a. “InCommon SSO”).
- Functions delivered in 2023:
  - **Looking Glass**: Run commands (in a safe and secure environment) against our production devices and get live results.
  - **Community**: Self-management of organizations, people, and roles.
  - **Interfaces**: Visualization of network ports and services.
  - **Virtual Networks**: Creation and management of L2 and L3 overlay networks, including CloudConnect.
- Functions planned for 2024:
  - **Routing Intentions**: Visualization and management of I2RE and I2PX routes and routing policy.



Virtual Networks

Virtual Networks

- **Visualization**, **management**, and **troubleshooting** for L2 and L3 **overlay networks**; a re-implementation and enhancement of similar functionality previously delivered via OESS/CloudConnect.
- **Virtual spaces** provide a canvas within which different organizations can **collaborate** on building overlays.
- **Virtual devices** (switches and routers) can be added to spaces to **establish** L2 and L3 overlays.
- **Virtual connections** can be added to devices to **connect** the overlays to interesting places: other Internet2 members or downstream sponsored parties, government and industry partners, cloud partners (AWS, Azure, GCP, OCI), etc.
- Provisioning of the overlay networks on Internet2's production network is handled via **Insight API** calls, with backend automation provided through **NTC Nautobot**, **Cisco NSO,** and other supporting tools.



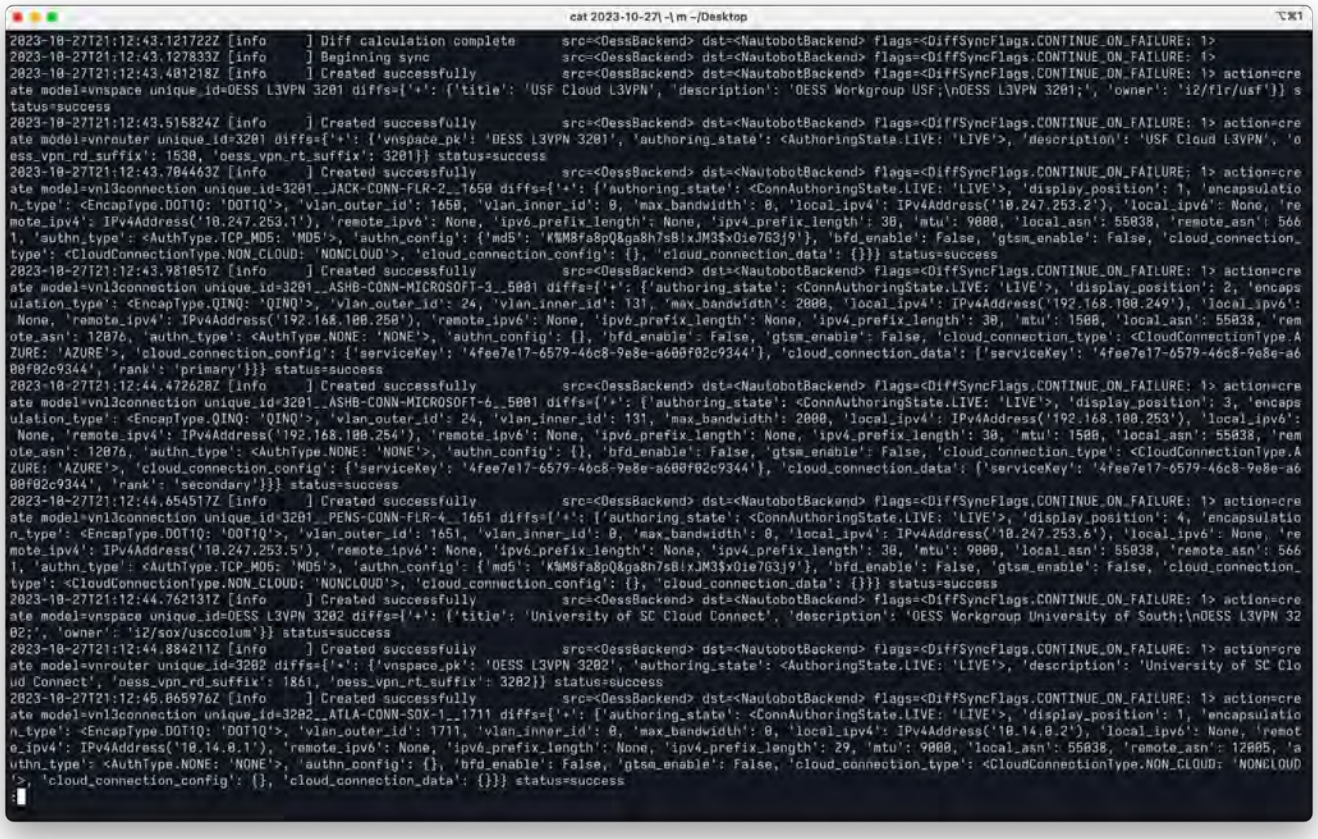
The Migration (October 2023)

Migration to Virtual Networks

- Officially maintenance window **Fri 10/27 5pm - Mon 10/30 8am.**
  - Unofficially we were all done after about four hours on Saturday morning.
  - Remainder of the weekend was spent verifying functionality and fixing a couple of bugs.
  - “Five minutes of typing and a few hours of watching things migrate.”

- **Some numbers**:
  - ~2,200 total connections migrated
  - ~800 ACLs migrated
  - ~2-3 that needed special attention due to bespoke configuration
  - Entirely hitless, no service degradations or outages

- **The advantages of automation/structured data**:
  - Migration becomes an ETL exercise.
  - Algorithmic: scriptable, less prone to human error.
  - Repeatable: you can practice ahead of time.
  - Predictable: you know the end result before you start, and can compare against that.



Since Then

From October Until Now

Trailing tasks:

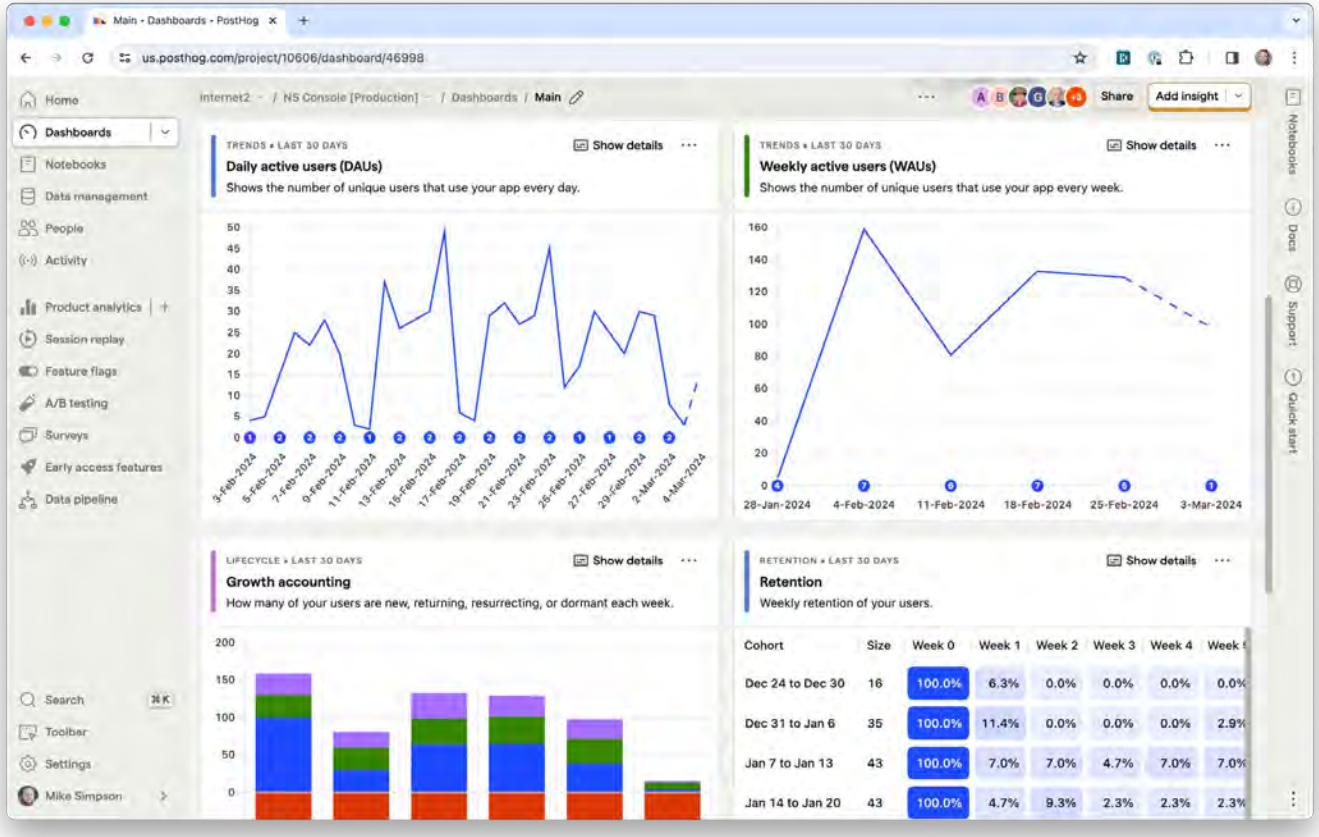
- Decommissioning and cleanup.
- Finishing up cloud automation.
- Squashing bugs.
- Improving a few things.

Adjusting to operational cadence:

- New products mean new support requirements:
  - Figuring out process, workflow, and handoffs.
  - Operational load and how it integrates into development work.
- Influx of tickets immediately after migration:
  - Mostly around organizations and affiliations.
  - Many requests for demos and walkthroughs.

More numbers (2024 year-to-date):

- ~130 unique Insight Console users per week
- ~48k Looking Glass queries (!!!)
- > 100 connections added to L2 overlays
- > 1000 connections added to L3 overlays (!!!)



Q&A