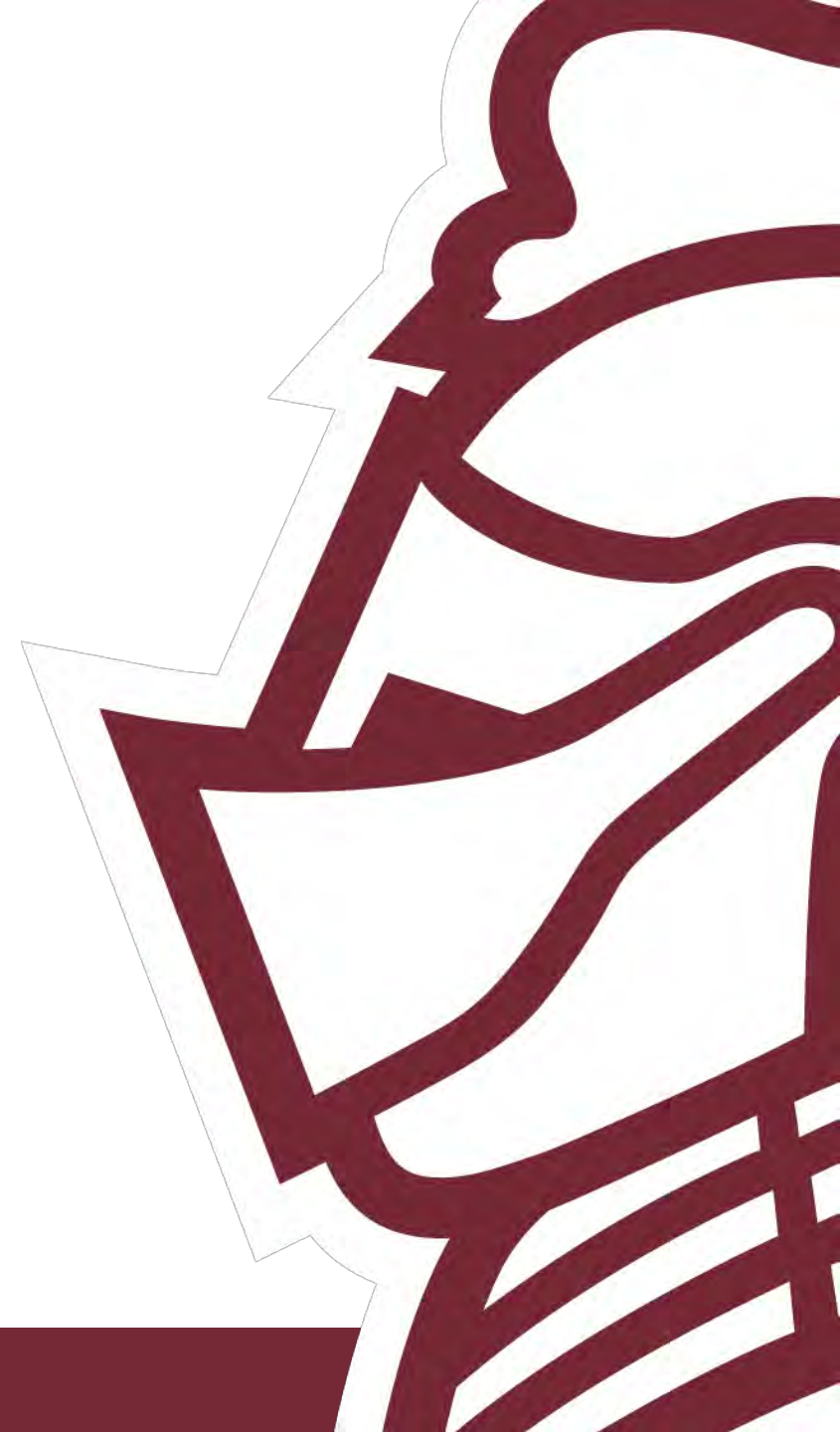


# Building Your IT Toolbox





# Who Am I?

- Tony Morrow
  - <https://lookanotherblog.com>
- Principal Solutions Architect @ Bellarmine University
- 16 years working at Bellarmine
- Focus
  - Networking
  - Wireless
  - Servers/Virtualization
  - Systems Integration
  - Problem Solving
  - PowerShell, PowerShell, PowerShell



# Topics

- Who Am I?
- What is *Free*?
- Asset Inventory with Netbox
- System Monitoring with Zabbix
- Logging with Elastic
- Other tools



# Disclaimer 😊

- I am not a Microsoft MVP or Partner
- All technologies showcased are using free, trial, or paid licenses
- All the opinions here are my own



# Free (not that *free*, but also that *free*)

- What do I mean by *free*?
  - Free to run the software however you want
  - Free to make changes to the software
  - Free to share the software and any changes
- It doesn't necessarily mean the software is \$0
- But also, yes, there is no cost to use the software
  - Because it is licensed under an open source license
    - Netbox: Apache 2.0 (<https://github.com/netbox-community/netbox?tab=Apache-2.0-1-ov-file#readme>)
    - Zabbix: AGPLv3 (<https://www.zabbix.com/license>)
    - Elastic\*: AGPLv3/Elastic License 2.0 (<https://www.elastic.co/pricing/faq/licensing>) \*it's complicated
  - Most developers provide compiled versions of the software making them easier to run



## And also *Free*

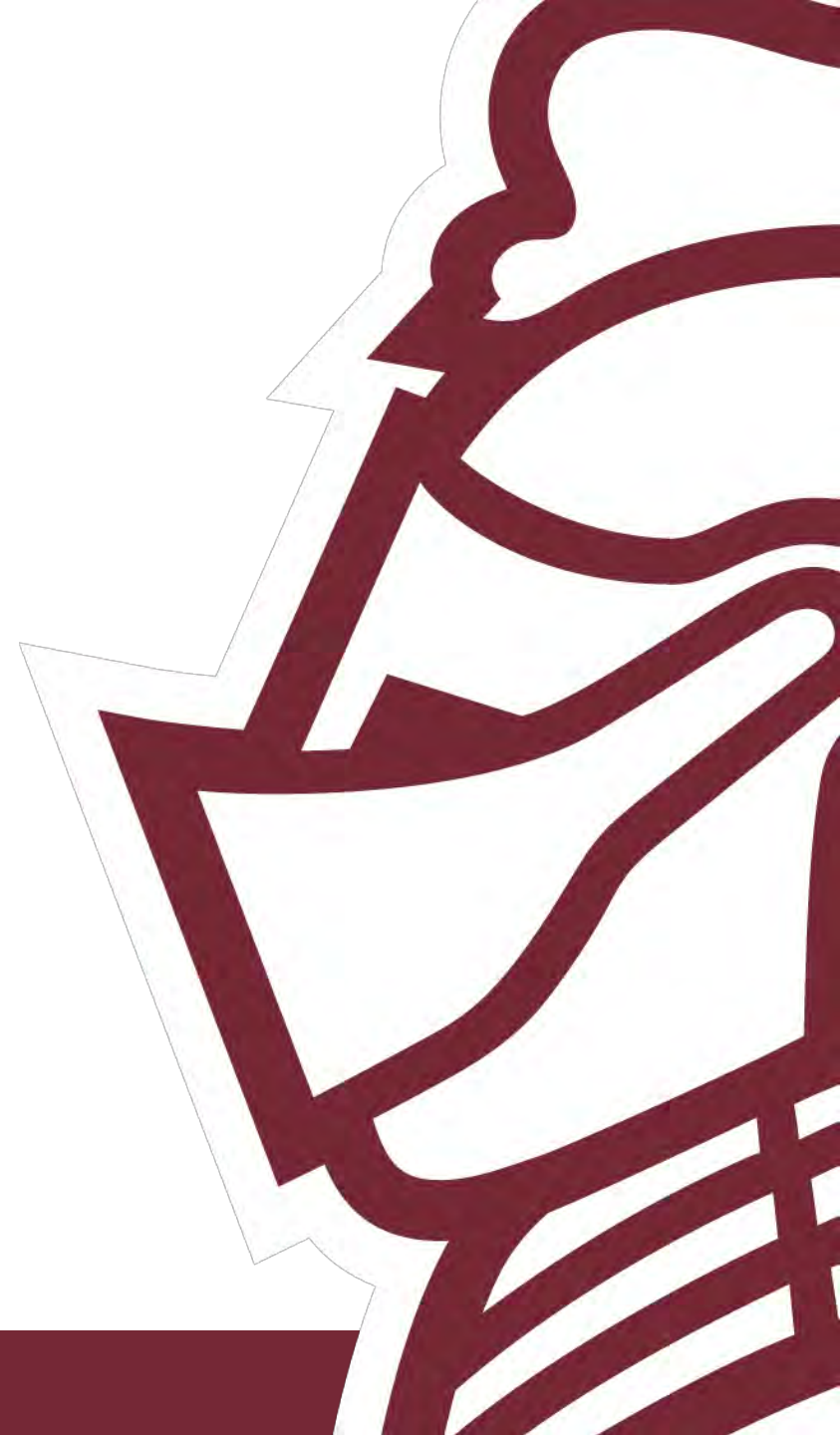
- You are responsible for the
  - care
  - feeding
  - cleaning up the poop on the carpet



# Asset Inventory with Netbox

Community Edition

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





# Old Method: Spreadsheets

- Issues:
  - Multiple people couldn't edit at once
  - Didn't capture all the device information
  - Couldn't tell us what was connected to what

toSave Off IP Addresses.xls - Read-Only - Compatibility Mode

Home Insert Draw Page Layout Formulas Data Review View Automate Help Power Pivot

Cut Copy Format Painter Clipboard Font Alignment Number Styles

Normal 5 Normal\_S...

Note 2 Normal

|     | A  | B                              | C                                      | D               | E                                   | F                        | G                 |
|-----|--|--------------------------------|--|-----------------|-------------------------------------|--------------------------|-------------------|
| 1   | it Date  | 1/7/2026                       |  | Subnet Mask     | 255.255.0.0                         |                          |                   |
| 2   | Updated  | 10/29/2004                     |  | Default Gateway | 10.1.0.254                          |                          |                   |
| 3   | Bellarmine University Computer Network Information |                                |  |                 |                                     |                          |                   |
| 4   | Address  | Serial #                       | Equipment                              | Location        | Sub-Location                        | H/W                      | F/W               |
| 5   | 1  | Master Node Cluster Project    | Dr. Mahmood's Cluster Node (8307)      | Pasteur Hall    | P209 - Physics Lab                  |                          |                   |
| 6   | 2  | SG33FLZ00X                     | MSM760 Controller                      | BLA-17          | Data Center                         |                          | 00:00:00:00:00:01 |
| 7   | 3  | GOLDDDB                        | Virtual                                |                 |                                     |                          |                   |
| 8   | 4  | SG33FLZ00X                     | HP 2920-48G-POE+ Switch(J9729A)        | Allen Hall      | IDF, 2nd Floor, New Wing            |                          | 00:00:00:00:00:01 |
| 9   | 5  | SG33FLZ00X                     | HP 2920-48G-POE+ Switch(J9729A)        | Allen Hall      | IDF, 3rd Floor, New Wing            |                          | 00:00:00:00:00:01 |
| 10  | 6  | SG33FLZ00X                     | HP 2920-48G-POE+ Switch(J9729A)        | Allen Hall      | IDF, 4th Floor, New Wing            |                          | 00:00:00:00:00:01 |
| 11  | 7  |                                |  |                 |                                     |                          |                   |
| 12  | 8  |                                |  |                 |                                     |                          |                   |
| 13  | 9  |                                |  |                 |                                     |                          |                   |
| 14  | 10   |                                |  |                 |                                     |                          |                   |
| 15  | 11   |                                |  |                 |                                     |                          |                   |
| 16  | 12   |                                |  |                 |                                     |                          |                   |
| 17  | 13   | GOLDTRANS                      | HP Proliant Server                     | Horgan Hall     | CSGOLD, TRANSACTION Sever           |                          |                   |
| 18  | 14   | SG33FLZ00X                     | ProCurve Switch 2810-24G (J9021A)      | BOB             | 1st Floor Switch Closet             | N 11.06, ROM N 10.01     | 00:00:00:00:00:01 |
| 19  | 15   |                                |  |                 |                                     |                          |                   |
| 20  | 16   |                                |  |                 |                                     |                          |                   |
| 21  | 17   |                                |  |                 |                                     |                          |                   |
| 22  | 18   |                                |  |                 |                                     |                          |                   |
| 23  | 19   | diebold - follet               | Diebold                                | Horgan Hall     | Bookstore                           |                          |                   |
| 24  | 20   | Crestron Docking Station       | Crestron Docking Station               | Library         | level 2 - Fraizer Board Room        |                          |                   |
| 25  | 21   | Crestron Control Processor     | Crestron Control Processor             | Library         | level 2 - Fraizer Board Room        |                          |                   |
| 26  | 22   | Polycom Soundstructure DSP     | Polycom Soundstructure DSP             | Library         | level 2 - Fraizer Board Room        |                          |                   |
| 27  | 23   | SG33FLZ00X                     | ProCurve Switch 2510-48 (J9020a)       | Horgan Hall     | Business Office, Ceiling            | U 11.08, ROM R 10.06     | 00:00:00:00:00:01 |
| 28  | 24   |                                |  |                 |                                     |                          |                   |
| 29  | 25   |                                |  |                 |                                     |                          |                   |
| 30  | 26   | SG33FLZ00X                     | ProCurve 2610-24-PWR                   | Siena Quarto    | Siena 2nd Floor, BDF in Boiler Room |                          |                   |
| 31  | 27   | SG33FLZ00X                     | HP 2530-48G-PoEP Switch(J9772A)        | SC-215          | SC-215                              | YA 15.10.0003, ROM YA 15 | 00:00:00:00:00:01 |
| 32  | 28   |                                |  |                 |                                     |                          |                   |
| 33  | 29   | SG33FLZ00X                     | ProCurve Switch 2610-24/12PWR (J9086A) | Newman Hall     | Boiler Room                         | R 11.30, ROM R 10.06     |                   |
| 34  | 30   |                                |  |                 |                                     |                          |                   |
| 35  | 31   | Crestron Touch Panel           | Crestron Touch Panel                   | Library         | level 2 - Fraizer Board Room        |                          |                   |
| 36  | 32   | Crestron Wireless Access Point | Crestron Wireless AP                   | Library         | level 2 - Fraizer Board Room        |                          |                   |
| 37  | 33   |                                |  |                 |                                     |                          |                   |
| 38  | 34   | SG33FLZ00X                     | ProCurve Switch 2510-48 (J9020a)       | IOS             | BL-B20                              | U 11.08, ROM R 10.06     | 00:00:00:00:00:01 |
| 39  | 35   |                                |  |                 |                                     |                          |                   |
| 40  | 36   | SG33FLZ00X                     | ProCurve Switch 2610-24-PWR (J9087A)   |                 |                                     |                          |                   |
| 41  | 37   |                                |  |                 |                                     |                          |                   |
| 42  | 38   |                                |  |                 |                                     |                          |                   |
| 43  | 39   |                                |  |                 |                                     |                          |                   |
| 44  | 40   |                                |  |                 |                                     |                          |                   |
| 45  | 41   |                                |  |                 |                                     |                          |                   |
| 46  | 42   |                                |  |                 |                                     |                          |                   |
| 47  | 43   |                                |  |                 |                                     |                          |                   |
| 48  | 44   |                                |  |                 |                                     |                          |                   |
| 49  | 45   |                                |  |                 |                                     |                          |                   |
| 50  | 46   |                                |  |                 |                                     |                          |                   |
| 51  | 47   |                                |  |                 |                                     |                          |                   |
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| 61  | 57   |                                |  |                 |                                     |                          |                   |
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| 74  | 70   |                                |  |                 |                                     |                          |                   |
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| 79  | 75   |                                |  |                 |                                     |                          |                   |
| 80  | 76   |                                |  |                 |                                     |                          |                   |
| 81  | 77   |                                |  |                 |                                     |                          |                   |
| 82  | 78   |                                |  |                 |                                     |                          |                   |
| 83  | 79   |                                |  |                 |                                     |                          |                   |
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| 86  | 82   |                                |  |                 |                                     |                          |                   |
| 87  | 83   |                                |  |                 |                                     |                          |                   |
| 88  | 84   |                                |  |                 |                                     |                          |                   |
| 89  | 85   |                                |  |                 |                                     |                          |                   |
| 90  | 86   |                                |  |                 |                                     |                          |                   |
| 91  | 87   |                                |  |                 |                                     |                          |                   |
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| 93  | 89   |                                |  |                 |                                     |                          |                   |
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| 95  | 91   |                                |  |                 |                                     |                          |                   |
| 96  | 92   |                                |  |                 |                                     |                          |                   |
| 97  | 93   |                                |  |                 |                                     |                          |                   |
| 98  | 94   |                                |  |                 |                                     |                          |                   |
| 99  | 95   |                                |  |                 |                                     |                          |                   |
| 100 | 96   |                                |  |                 |                                     |                          |                   |
| 101 | 97   |                                |  |                 |                                     |                          |                   |
| 102 | 98   |                                |  |                 |                                     |                          |                   |
| 103 | 99   |                                |  |                 |                                     |                          |                   |
| 104 | 100  |                                |  |                 |                                     |                          |                   |
| 105 | 101  |                                |  |                 |                                     |                          |                   |
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| 112 | 108  |                                |  |                 |                                     |                          |                   |
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| 114 | 110  |                                |  |                 |                                     |                          |                   |
| 115 | 111  |                                |  |                 |                                     |                          |                   |
| 116 | 112  |                                |  |                 |                                     |                          |                   |
| 117 | 113  |                                |  |                 |                                     |                          |                   |
| 118 | 114  |                                |  |                 |                                     |                          |                   |
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| 128 | 124  |                                |  |                 |                                     |                          |                   |
| 129 | 125  |                                |  |                 |                                     |                          |                   |
| 130 | 126  |                                |  |                 |                                     |                          |                   |
| 131 | 127  |                                |  |                 |                                     |                          |                   |
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| 133 | 129  |                                |  |                 |                                     |                          |                   |
| 134 | 130  |                                |  |                 |                                     |                          |                   |
| 135 | 131  |                                |  |                 |                                     |                          |                   |
| 136 | 132  |                                |  |                 |                                     |                          |                   |
| 137 | 133  |                                |  |                 |                                     |                          |                   |
| 138 | 134  |                                |  |                 |                                     |                          |                   |
| 139 | 135  |                                |  |                 |                                     |                          |                   |
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| 143 | 139  |                                |  |                 |                                     |                          |                   |
| 144 | 140  |                                |  |                 |                                     |                          |                   |
| 145 | 141  |                                |  |                 |                                     |                          |                   |
| 146 | 142  |                                |  |                 |                                     |                          |                   |
| 147 | 143  |                                |  |                 |                                     |                          |                   |
| 148 | 144  |                                |  |                 |                                     |                          |                   |
| 149 | 145  |                                |  |                 |                                     |                          |                   |
| 150 | 146  |                                |  |                 |                                     |                          |                   |
| 151 | 147  |                                |  |                 |                                     |                          |                   |
| 152 | 148  |                                |  |                 |                                     |                          |                   |
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| 154 | 150  |                                |  |                 |                                     |                          |                   |
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| 158 | 154  |                                |  |                 |                                     |                          |                   |
| 159 | 155  |                                |  |                 |                                     |                          |                   |
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| 257 | 253  |                                |  |                 |                                     |                          |                   |
| 258 | 254  |                                |  |                 |                                     |                          |                   |





# New Method: Netbox

- What is Netbox? <https://netboxlabs.com/>
  - The “source of truth” for your infrastructure and datacenter
  - Device inventory
    - Hardware type
    - Serial number
    - Asset Tag
    - Components
  - IP Management
    - Prefixes
    - ASNs
    - VLANs
  - Connections
    - Patch panels
    - Cables
    - Connections between devices
  - Racks
    - Hardware U space

- What Netbox is not or doesn't do?
  - Not a replacement for monitoring or logging
  - Doesn't scan the network for devices\*
  - Doesn't automatically update device information or connections\*

\*Netbox Labs has announced new tools as part of their paid cloud offerings

# Netbox Devices



Organization

Racks

Devices

DEVICES

Devices

Modules

Device Roles

Platforms

Virtual Chassis

Virtual Device Contexts

DEVICE TYPES

Device Types

Module Types

Module Type Profiles

Manufacturers

DEVICE COMPONENTS

Interfaces

Front Ports

Rear Ports

Console Ports

Console Server Ports

Power Ports

Power Outlets

Module Bays

Search...

amorrow@bellarmine.edu  
Admin

+ Add

+ Import

+ Export

Results 47

Filters 2

Role: Access Switch

Manufacturer: Dell

Clear all

Save

Quick search

Configure Table

Showing 1-47 of 47

Per Page

| ID  | NAME                      | SERIAL NUMBER | ASSET TAG | STATUS | MAC ADDRESS | IP ADDRESS    | SITE                 | LOCATION | RACK | ROLE          | MANUFACTURER | TYPE               | BATTERY CHANGE DATE |
|-----|---------------------------|---------------|-----------|--------|-------------|---------------|----------------------|----------|------|---------------|--------------|--------------------|---------------------|
| 471 | ALLN251-N2048P-01         |               |           | Active |             | 10.1.0.199/16 | Allen Hall           | ALLN251  |      | Access Switch | Dell         | PowerSwitch N2048P |                     |
| 473 | ALLN353-N2048P-01         |               |           | Active |             | 10.1.0.239/16 | Allen Hall           | ALLN353  |      | Access Switch | Dell         | PowerSwitch N2048P |                     |
| 472 | ALLN400D-04-N2048P        |               |           | Active |             | 10.1.0.237/16 | Allen Hall           | ALLN400D |      | Access Switch | Dell         | PowerSwitch N2048P |                     |
| 163 | Baseball-Pressbox-N2024P  |               |           | Active |             | 10.1.0.179/16 | Baseball Press Box   |          |      | Access Switch | Dell         | PowerSwitch N2024P |                     |
| 347 | CNCH067-Stack N2048P (01) |               |           | Active |             | 10.1.0.17/16  | Centro, McGowan Hall | CNMH067  |      | Access Switch | Dell         | PowerSwitch N2048P |                     |
| 348 | CNCH067-Stack N2048P (02) |               |           | Active |             |               | Centro, McGowan Hall | CNMH067  |      | Access Switch | Dell         | PowerSwitch N2048P |                     |
| 345 | CNCHBDF-01 N4032F         |               |           | Active |             | 10.1.0.15/16  | Centro, McGowan Hall | BDF      |      | Access Switch | Dell         | PowerSwitch N4032F |                     |

[illegible]

# Netbox: IP Management



netbox Community

Organization Racks Devices Connections Wireless IPAM IP ADDRESSES IP Addresses IP Ranges PREFIXES Prefixes Prefix & VLAN Roles ASNS ASN Ranges ASNs AGGREGATES Aggregates RIRs VRFS VRFS Route Targets VLANS

Search...

Results 72 Filters

Quick search

Hide Depth indicators Max Depth Max Length + Add + Import + Export

Showing 1-72 of 72

| PREFIX           | DATETIME         | STATUS | CHILDREN | UTILIZATION | VLAN             | DESCRIPTION                      |
|------------------|------------------|--------|----------|-------------|------------------|----------------------------------|
| 4.37114.176/29   | 4.37114.177/29   | Active | 0        | 33.3%       | Lumen INET (109) | Lumen INET                       |
| 10.1.0.0/16      | 10.1.0.254/16    | Active | 3        | 0.0%        | Private (2)      | —                                |
| + 10.1.0.0/24    | —                | Active | 0        | 44.0%       | —                | Network Management               |
| + 10.1.50.0/24   | —                | Active | 0        | 0.0%        | —                | Printers: Departments            |
| + 10.1.53.0/24   | —                | Active | 0        | 29.1%       | —                | UPS                              |
| 10.10.0.0/16     | —                | Active | 2        | 0.2%        | Public (3)       | Public                           |
| + 10.10.50.0/24  | —                | Active | 0        | 0.0%        | —                | Printers: Public                 |
| + 10.10.53.0/24  | —                | Active | 0        | 30.3%       | —                | Nursing Simlab Hardware          |
| 10.20.0.0/16     | 10.20.0.254/16   | Active | 2        | 10.8%       | Dorm (4)         | Dorm                             |
| + 10.20.0.0/23   | —                | Active | 0        | 65.0%       | —                | APs: Residence Halls             |
| + 10.20.50.0/23  | —                | Active | 0        | 74.0%       | —                | APs: Residence Halls Hospitality |
| 10.30.0.0/16     | 10.30.0.254/16   | Active | 1        | 0.4%        | Wireless (5)     | —                                |
| + 10.30.0.0/23   | —                | Active | 0        | 94.0%       | —                | APs: Campus                      |
| 10.70.0.0/16     | 10.70.0.254/16   | Active | 0        | 0.0%        | CARS (8)         | —                                |
| 10.90.0.0/16     | 10.90.0.254/16   | Active | 1        | 0.1%        | Server (8)       | Server                           |
| + 10.90.0.0/23   | —                | Active | 0        | 14.7%       | —                | —                                |
| 10.100.11.0/24   | —                | Active | 0        | 3.3%        | Replication (11) | —                                |
| 10.100.13.0/24   | —                | Active | 0        | 3.9%        | iSCSI2 (13)      | —                                |
| 10.100.14.0/24   | 10.100.14.254/24 | Active | 0        | 10.3%       | DC-Mgmt (14)     | —                                |
| 10.100.16.0/24   | —                | Active | 0        | 14.2%       | iSCSI1 (16)      | —                                |
| 10.100.17.224/30 | 10.100.17.224/30 | Active | 0        | 100.0%      | CoLo-Tunnel (17) | —                                |

netbox Community

Organization Racks Devices Connections Wireless IPAM IP ADDRESSES IP Addresses IP Ranges PREFIXES Prefixes Prefix & VLAN Roles ASNS ASN Ranges ASNs AGGREGATES Aggregates RIRs VRFS VRFS Route Targets VLANS

Search...

Prefixes 10.1.0.0/24

Created 2025-01-30 15:02 Updated 2025-01-30 15:02

+ Add IP Address + Bookmark + Subscribe + Clone + Edit + Delete

Prefix Child Prefixes Child Ranges IP Addresses 175 Contacts Journal Changelog

Quick search

Configure Table

Showing 1-223 of 223

Per Page

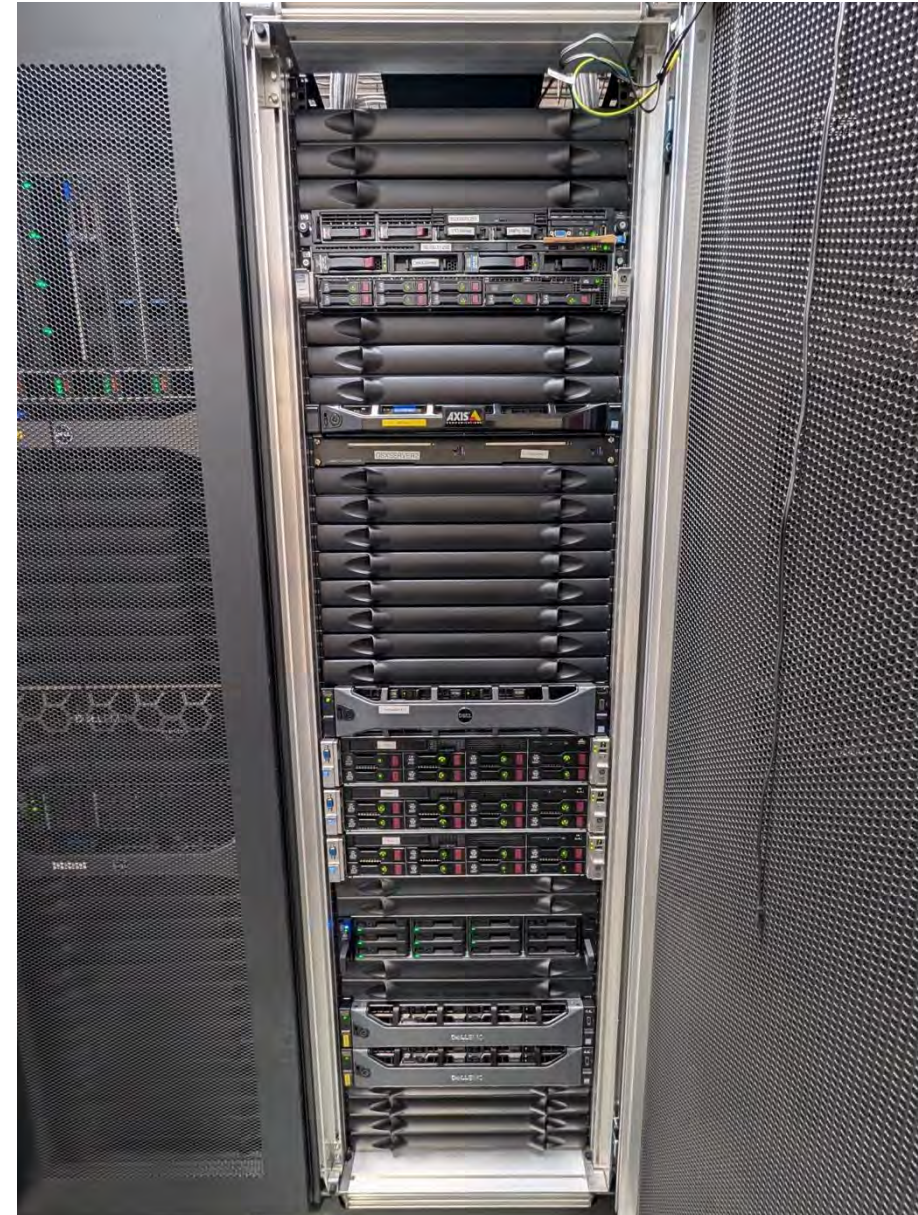
| IP ADDRESS      | VMP    | STATUS    | ASSIGNED | DNS NAME | DESCRIPTION           | PARENT                             |
|-----------------|--------|-----------|----------|----------|-----------------------|------------------------------------|
| 2 IPs available | Global | Available | —        | —        | —                     | —                                  |
| 10.1.0.3/16     | Global | Active    | ✓        | —        | —                     | SCCMS                              |
| 1 IP available  | Global | Available | —        | —        | —                     | —                                  |
| 10.1.0.5/16     | Global | Active    | ✓        | —        | —                     | BUGOLD08                           |
| 10.1.0.6/16     | Global | Active    | ✓        | —        | —                     | Allen2-01-HP2920-48G-POE           |
| 10.1.0.7/16     | Global | Active    | ✓        | —        | —                     | Allen3-01-HP2920-48G-POE           |
| 10.1.0.8/16     | Global | Active    | ✓        | —        | —                     | Allen4-01-HP2920-48G-POE           |
| 10.1.0.9/16     | Global | Active    | ✓        | —        | —                     | CNMH180-01 SG300-10MPP             |
| 1 IP available  | Global | Available | —        | —        | —                     | —                                  |
| 10.1.0.11/16    | Global | Active    | ✓        | —        | —                     | CNMH176-01-SG300-10PP              |
| 10.1.0.12/16    | Global | Active    | ✓        | —        | —                     | CNMH170-01-SG300-10PP              |
| 10.1.0.13/16    | Global | Active    | ✓        | —        | —                     | BUGOLDTRANS                        |
| 10.1.0.14/16    | Global | Active    | ✓        | —        | —                     | MDF-2810-24                        |
| 10.1.0.15/16    | Global | Active    | ✓        | —        | —                     | CNCHBDF-01 N4032F (A16817)         |
| 10.1.0.16/16    | Global | Active    | ✓        | —        | —                     | CNCHBDF-02 N2048P (A16818)         |
| 10.1.0.17/16    | Global | Active    | ✓        | —        | —                     | CNCH087-Stack N2048P (01) (A16819) |
| 10.1.0.18/16    | Global | Active    | ✓        | —        | —                     | CNTH225B-01 N2048P (A17587)        |
| 10.1.0.19/16    | Global | Active    | ✓        | —        | —                     | CNMH163-Stack DellN2048P (01)      |
| 10.1.0.20/24    | Global | Active    | —        | —        | BookStore Prox Reader | —                                  |
| 10.1.0.21/16    | Global | Active    | ✓        | —        | —                     | MDF-ISP-S5212F-ON (A20613)         |
| 10.1.0.22/24    | Global | Active    | ✓        | —        | —                     | BDF-ISP-S5212F-ON (A20614)         |
| 10.1.0.23/16    | Global | Active    | ✓        | —        | —                     | WallOffire1-PA3440 (A20611)        |
| 10.1.0.24/16    | Global | Active    | ✓        | —        | —                     | WallOffire2-PA3440 (A20612)        |



# Netbox: Racks

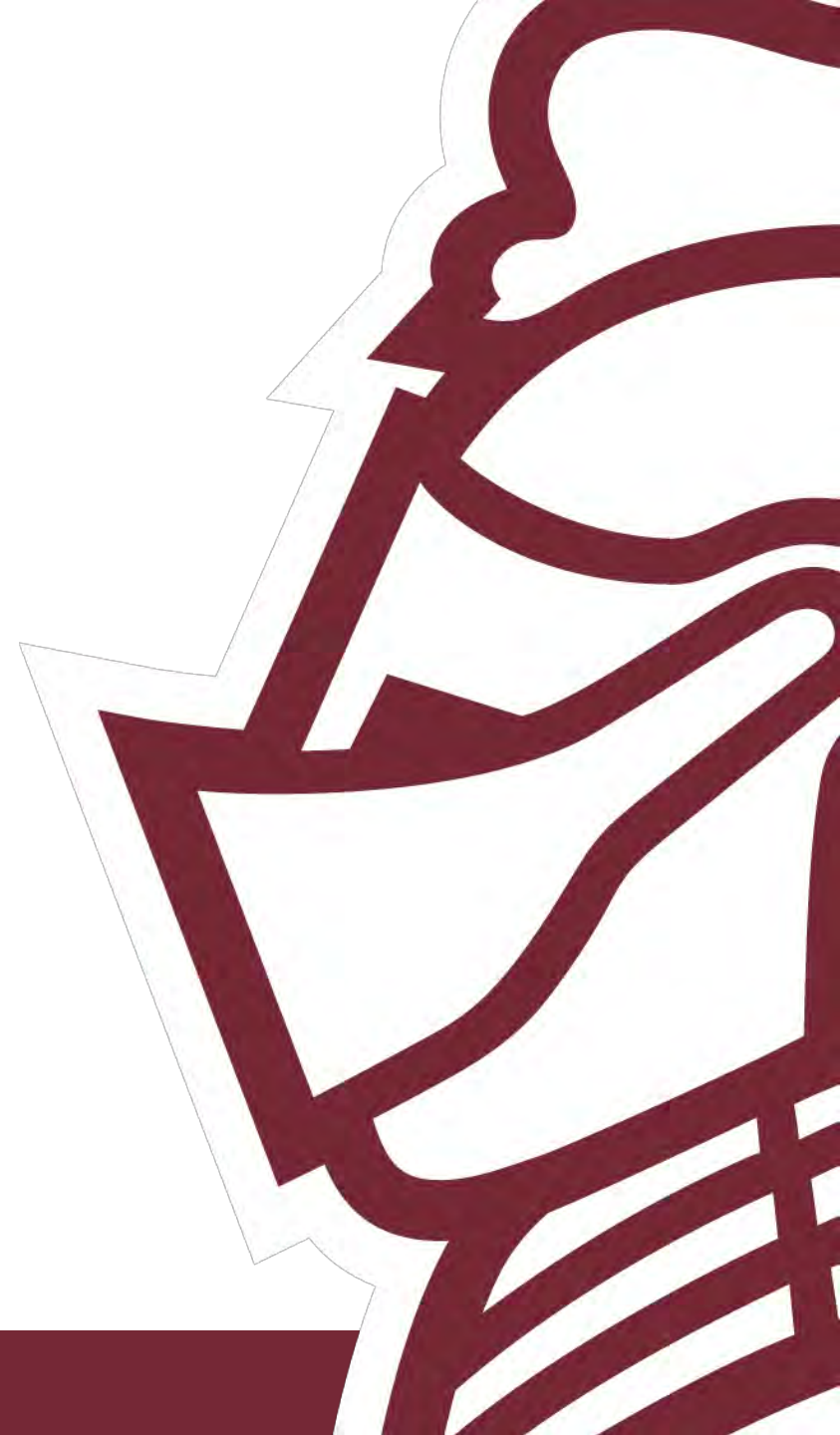
The screenshot displays the Netbox web interface for a specific rack configuration. The left sidebar shows the navigation menu with categories like Organization, Racks, Rack Roles, Reservations, Elevations, Rack Types, Devices, Connections, Wireless, IPAM, VPN, Virtualization, Circuits, Power, Provisioning, Customization, and Operations. The main content area is titled 'Rack / Datacenter - Primary' and 'Rack Server Rack 02'. It includes a search bar, user information (anncrow@petalpine.edu), and a toolbar with actions like Bookmark, Subscribe, Clone, Edit, and Delete. The interface is divided into several sections: a metadata table on the left, a 'Front' and 'Rear' view diagram in the center, and a 'Related Objects' section at the bottom right. The metadata table lists various attributes such as Region, Site, Location, Facility ID, Tenant, Status, Rack Type, Role, Description, Serial Number, Asset Tag, Airflow, Space Utilization, Power Utilization, Dimensions, Form factor, Width, Height, Outer Width, Outer Height, Outer Depth, Mounting Depth, Numbering, Starting Unit, Descending Units, Weight, Tags, Comments, and Images. The 'Front' and 'Rear' view diagram shows a 42U rack with various components like IP01, OneX, Zabbix, S5CNR1, OSKServer Rack (2/2), MailArchiva, ELK2, ELK3, ELK4, OCPA-PhotoVideo, and SECNRV1, SECNRV2. The 'Related Objects' section shows a list of related objects with columns for ID, Name, and Type.

| Attribute         | Value                         |
|-------------------|-------------------------------|
| Region            | —                             |
| Site              | Datacenter - Primary          |
| Location          | —                             |
| Facility ID       | —                             |
| Tenant            | —                             |
| Status            | Active                        |
| Rack Type         | —                             |
| Role              | —                             |
| Description       | —                             |
| Serial Number     | —                             |
| Asset Tag         | —                             |
| Airflow           | —                             |
| Space Utilization | 0%                            |
| Power Utilization | 0%                            |
| Dimensions        | —                             |
| Form factor       | —                             |
| Width             | 19 inches                     |
| Height            | 42U                           |
| Outer Width       | —                             |
| Outer Height      | —                             |
| Outer Depth       | —                             |
| Mounting Depth    | —                             |
| Numbering         | —                             |
| Starting Unit     | 1                             |
| Descending Units  | X                             |
| Weight            | —                             |
| Rack Weight       | —                             |
| Maximum Weight    | —                             |
| Total Weight      | 88.2 Kilograms (194.4 Pounds) |
| Tags              | No tags assigned              |
| Comments          | None                          |
| Images            | No image attachments found    |



# Network/Service Monitoring with Zabbix

<https://www.zabbix.com/>





# What is Zabbix?

- Monitoring and Alerting
- What can you monitor?
  - Network stuff
  - Server stuff
  - DB stuff
  - Cloud stuff
  - VM stuff
  - Application stuff





# Zabbix Problems Monitoring

**ZABBIX** << >> Problems Export to CSV

Time Severity Recovery time Status Info Host Problem Duration Update Actions Tags

|                          |                        |         |  |         |                           |  |            |                        |   |
|--------------------------|------------------------|---------|--|---------|---------------------------|--|------------|------------------------|---|
| <input type="checkbox"/> | 11:09:11 AM            | Warning |  | PROBLEM | dc-libr-mx740c-05-IDRAC   | CPU2 Temp: Temperature is above warning threshold: >70 | 8m 2s      | <a href="#">Update</a> | Application: Temperature                                |
| <input type="checkbox"/> | 11:00                  |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 10:54:09 AM            | Warning |  | PROBLEM | dc-libr-mx740c-02-IDRAC   | CPU2 Temp: Temperature is above warning threshold: >70 | 23m 4s     | <a href="#">Update</a> | Application: Temperature                                |
| <input type="checkbox"/> | Today                  |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 2026-01-24 09:54:08 AM | Warning |  | PROBLEM | DC Liebert                | Device Status: Normal with Warning on DC Liebert       | 4d 1h 23m  | <a href="#">Update</a> | Application: Status                                     |
| <input type="checkbox"/> | 2026                   |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 2025-12-13 09:14:50 PM | Warning |  | PROBLEM | SP106-02 2610-48-PWR      | Interface 32(): In half-duplex mode                    | 1M 15d 14h | <a href="#">Update</a> | Application: Interface 32()                             |
| <input type="checkbox"/> | December               |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 2025-11-25 01:03:15 PM | Average |  | PROBLEM | DC-LIBR-Fortigate90G-01   | FortiGate: Port 443 is unavailable                     | 2M 3d 22h  | <a href="#">Update</a> | class: network component: health component: network *** |
| <input type="checkbox"/> | 2025-11-14 03:06:37 AM | Warning |  | PROBLEM | VEEAMPROXY1               | E:: Disk space is low (used > 85%)                     | 2M 15d 8h  | <a href="#">Update</a> | Application: Filesystem E:                              |
| <input type="checkbox"/> | November               |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 2025-08-19 01:32:41 PM | Warning |  | PROBLEM | ST123-Stack-ICX8200       | Interface ethernet 2/1/25(): In half-duplex mode       | 5M 11d 22h | <a href="#">Update</a> | Application: Interface ethernet 2/1/25()                |
| <input type="checkbox"/> | August                 |         |  |         |                           |  |            |                        |   |
| <input type="checkbox"/> | 2025-07-20 01:17:11 AM | Warning |  | PROBLEM | Allen4-01-HP2920-48G-POEP | Interface 9(): In half-duplex mode                     | 6M 12d 11h | <a href="#">Update</a> | Application: Interface 9()                              |

Displaying 8 of 8 found





# Zabbix System Information

| ZABBIX |  |  | System information                                 |            |                               |
|--------|--|--|--|------------|-------------------------------|
| zabbix |  |  | Parameter  | Value      | Details                       |
|        |  |  | Zabbix server is running                           | Yes        | localhost:10051               |
|        |  |  | Zabbix server version                              | 7.4.6      | Up to date                    |
|        |  |  | Zabbix frontend version                            | 7.4.6      | Up to date                    |
|        |  |  | Software update last checked                       | 2026-01-28 |                               |
|        |  |  | Latest release                                     | 7.4.6      | <a href="#">Release notes</a> |
|        |  |  | Number of hosts (enabled/disabled)                 | 1513       | 1182 / 331                    |
|        |  |  | Number of templates                                | 254        |                               |
|        |  |  | Number of items (enabled/disabled/not supported)   | 173155     | 108323 / 64646 / 186          |
|        |  |  | Number of triggers (enabled/disabled [problem/ok]) | 89639      | 31495 / 58144 [16 / 31479]    |
|        |  |  | Number of users (online)                           | 9          | 2                             |
|        |  |  | Required server performance, new values per second | 811.85     |                               |
|        |  |  | Global scripts on Zabbix server                    | Disabled   |                               |
|        |  |  | High availability cluster                          | Disabled   |                               |

# Zabbix Hosts Lists



ZABBIX

zabbix

Dashboards

Monitoring

Services

Inventory

Reports

Data collection

Template groups

Host groups

Templates

Hosts

Maintenance

Event correlation

Discovery

Alerts

Users

Administration

Support

Integrations

Help

User settings

Sign out

Hosts

Filter

| <input type="checkbox"/> | Name                              | Items     | Triggers     | Graphs    | Discovery   | Web | Interface          | Proxy        | Templates   | Status   | Availability | Agent encryption | Info | Tags     |
|--------------------------|-----------------------------------|-----------|--------------|-----------|-------------|-----|--------------------|--------------|---|----------|--------------|------------------|------|----------|
| <input type="checkbox"/> | 3408Newburg-01 2610-48-PWR        | Items 531 | Triggers 266 | Graphs 52 | Discovery 1 | Web | 10.1.0.125:10050   |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | 3408Newburg-02 2620-48-PWR        | Items 531 | Triggers 266 | Graphs 52 | Discovery 1 | Web | 10.1.0.189:10050   |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | 3408Newburg-1-UPS1.bellarmine.edu | Items 30  | Triggers 8   | Graphs 2  | Discovery 4 | Web | 10.1.53.93:10050   | ZabbixProxy1 | Bellarmine Template Eaton UPS (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | 3408Newburg-1-UPS2.bellarmine.edu | Items 30  | Triggers 8   | Graphs 2  | Discovery 4 | Web | 10.1.53.94:10050   | ZabbixProxy1 | Bellarmine Template Eaton UPS (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | 3408NewburgTest 2610-48-PWR       | Items 531 | Triggers 266 | Graphs 52 | Discovery 1 | Web | 10.1.0.105:10050   |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Disabled | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ACMECHALLENGE                     | Items 103 | Triggers 72  | Graphs 11 | Discovery 4 | Web | 10.100.19.30:10050 |              | Bellarmine Windows by Zabbix agent (Windows CPU by Zabbix agent, Windows filesystems by Zabbix agent, Windows generic by Zabbix agent, Windows memory by Zabbix agent, Windows network by Zabbix agent, Windows physical disks by Zabbix agent, Windows services by Zabbix agent, Zabbix agent) | Enabled  | ZBX          | PSK              | None | PSK CERT |
| <input type="checkbox"/> | AL-109-01 2610-48PWR              | Items 541 | Triggers 271 | Graphs 53 | Discovery 1 | Web | 10.1.0.194:10050   |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALERTUS                           | Items 122 | Triggers 85  | Graphs 16 | Discovery 4 | Web | 10.100.20.46:10050 |              | Bellarmine Windows by Zabbix agent (Windows CPU by Zabbix agent, Windows filesystems by Zabbix agent, Windows generic by Zabbix agent, Windows memory by Zabbix agent, Windows network by Zabbix agent, Windows physical disks by Zabbix agent, Windows services by Zabbix agent, Zabbix agent) | Disabled | ZBX          | PSK              | None | PSK CERT |
| <input type="checkbox"/> | Allen-Bridge                      | Items 3   | Triggers 3   | Graphs    | Discovery   | Web | 10.30.0.253:10050  |              | ICMP Ping   | Enabled  | ZBX          |                  | None |          |
| <input type="checkbox"/> | Allen2-01-HP2920-48G-POE          | Items 501 | Triggers 251 | Graphs 49 | Discovery 1 | Web | 10.1.0.6:10050     |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | Allen3-01-HP2920-48G-POE          | Items 501 | Triggers 251 | Graphs 49 | Discovery 1 | Web | 10.1.0.7:10050     |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | Allen4-01-HP2920-48G-POEP         | Items 501 | Triggers 251 | Graphs 49 | Discovery 1 | Web | 10.1.0.8:10050     |              | Bellarmine Network Generic Device SNMP (Bellarmine Interfaces SNMP, Generic SNMP)   | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP01_old                   | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.182:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP02                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.183:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP03                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.184:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP04                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.185:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP05                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.186:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP06                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.187:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP07                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.188:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-AP08                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.189:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-1-UPS1.bellarmine.edu        | Items 30  | Triggers 8   | Graphs 2  | Discovery 4 | Web | 10.1.53.104:10050  | ZabbixProxy1 | Bellarmine Template Eaton UPS (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-2-AP01                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.190:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |
| <input type="checkbox"/> | ALLN-2-AP02                       | Items 11  | Triggers 6   | Graphs    | Discovery   | Web | 10.30.1.191:10050  |              | Bellarmine Wireless Generic Device SNMP (Generic SNMP)  | Enabled  | ZBX          | SNMP             | None |          |

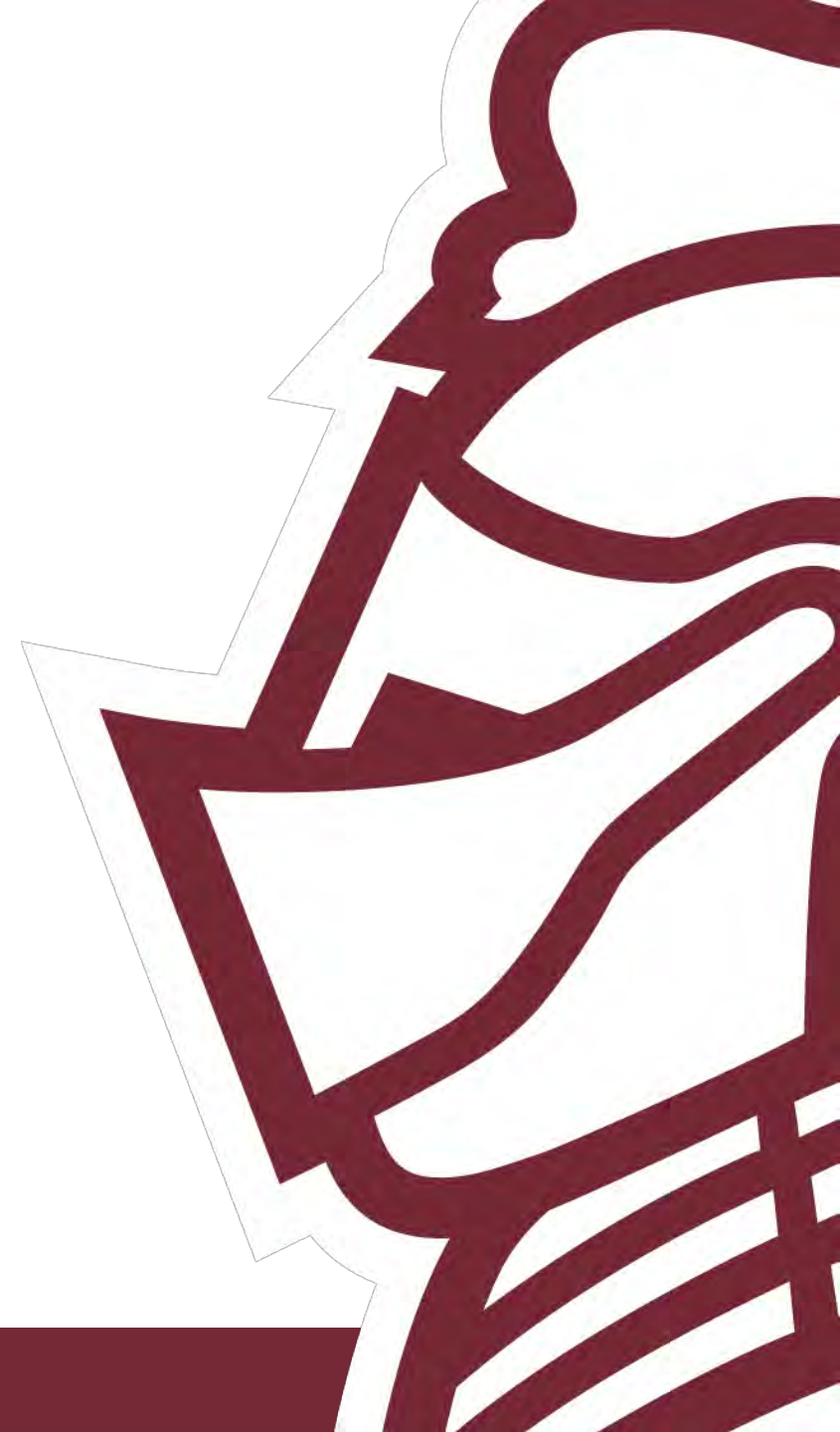


# Templates (<https://www.zabbix.com/integrations>)

| ZABBIX  |       |          |             |          |              |             |     |        |         |   |      |
|---|-------|----------|-------------|----------|--------------|-------------|-----|--------|---------|---|------|
| Templates   |       |          |             |          |              |             |     |        |         |   |      |
| Create template Import                                    |       |          |             |          |              |             |     |        |         |   |      |
| Filter  |       |          |             |          |              |             |     |        |         |   |      |
| <input type="checkbox"/> Name                             | Hosts | Items    | Triggers    | Graphs   | Dashboards   | Discovery   | Web | Vendor | Version | Linked templates                                  | Tags |
| <input type="checkbox"/> AIX                              | Hosts | Items 43 | Triggers 10 | Graphs 4 | Dashboards 1 | Discovery 2 | Web |        |         | Zabbix agent                                      |      |
| <input type="checkbox"/> Alcatel Timetra TIMOS SNMP       | Hosts | Items 18 | Triggers 9  | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         | EtherLike-MIB SNMP, Generic SNMP, Interfaces SNMP |      |
| <input type="checkbox"/> Apache ActiveMQ by JMX           | Hosts | Items    | Triggers    | Graphs   | Dashboards   | Discovery 2 | Web |        |         |   |      |
| <input type="checkbox"/> Apache by HTTP                   | Hosts | Items 22 | Triggers 5  | Graphs 3 | Dashboards 1 | Discovery 1 | Web |        |         |   |      |
| <input type="checkbox"/> Apache by Zabbix agent           | Hosts | Items 26 | Triggers 6  | Graphs 4 | Dashboards 1 | Discovery 1 | Web |        |         |   |      |
| <input type="checkbox"/> Apache Cassandra by JMX          | Hosts | Items 67 | Triggers 6  | Graphs 7 | Dashboards   | Discovery 1 | Web |        |         |   |      |
| <input type="checkbox"/> Apache Kafka by JMX              | Hosts | Items 62 | Triggers 11 | Graphs 9 | Dashboards   | Discovery 3 | Web |        |         |   |      |
| <input type="checkbox"/> Apache Tomcat JMX                | Hosts | Items 1  | Triggers 1  | Graphs   | Dashboards   | Discovery 4 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS 2200 RM SNMP       | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS 3000 XLM SNMP      | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS RT 1000 RM XL SNMP | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS RT 1000 XL SNMP    | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS SRT 5000 SNMP      | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |
| <input type="checkbox"/> APC Smart-UPS SRT 5000 SNMP bkp  | Hosts | Items 25 | Triggers 22 | Graphs 3 | Dashboards   | Discovery 6 | Web |        |         |   |      |

# Logging with Elastic Stack

<https://www.elastic.co>



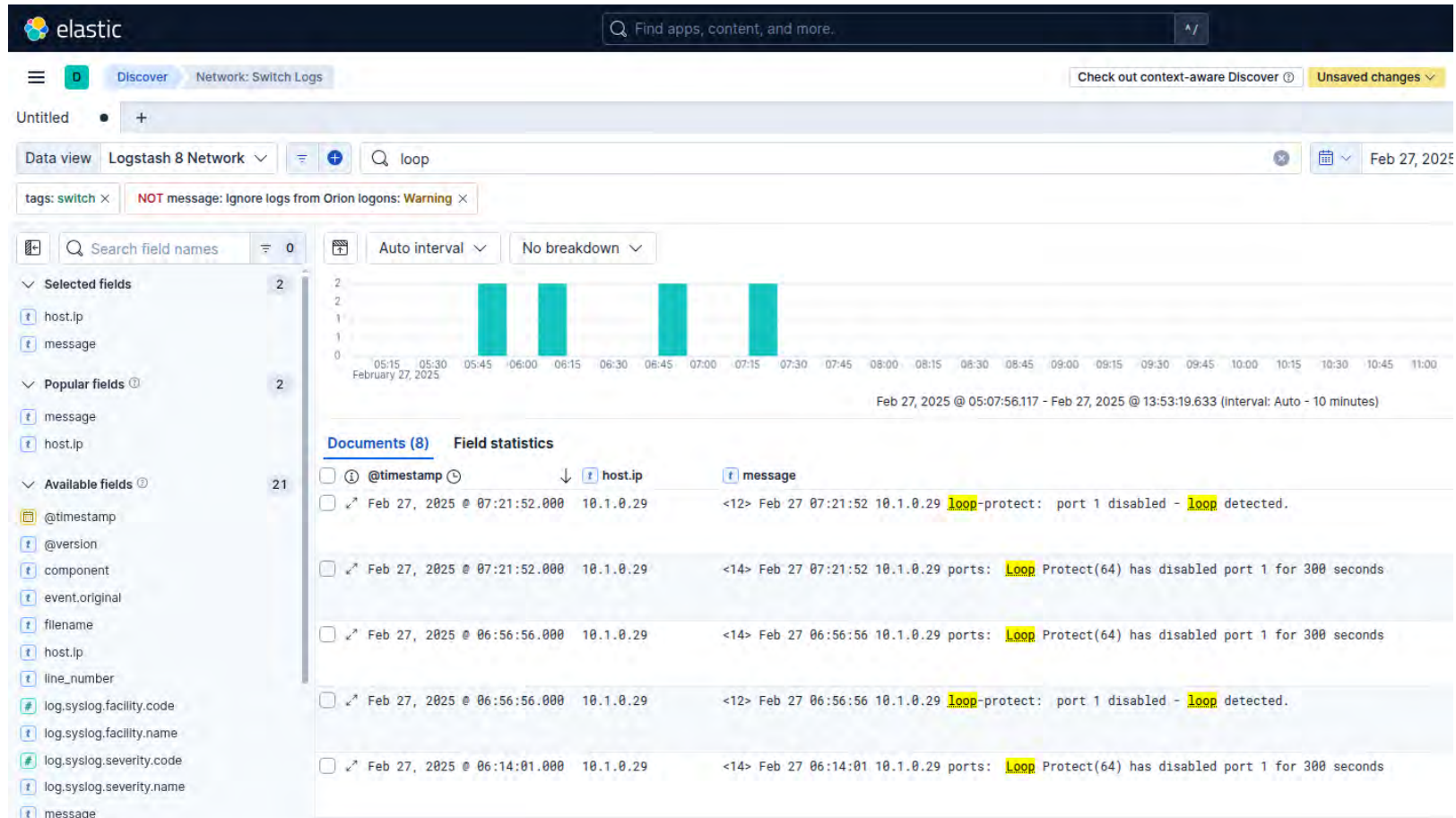


# What is Elastic Stack

- Centralized logging system for EVERYTHING
  - Syslog
  - File based logs
  - API based monitoring
  - Windows Event Logs
  - Audit monitoring
  - Metrics monitoring
- Data analytics and visualizations
- Act as a SIEM



# Elastic Discovery Search





# Elastic's Beats Data Shippers (<https://www.elastic.co/beats>)



+ New Forrester Wave Leader, Q2 2025 [Access report](#)

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All kinds of shippers for all kinds of data.



**Filebeat**

Lightweight shipper for logs and other data



**Metricbeat**

Lightweight shipper for metric data



**Packetbeat**

Lightweight shipper for network data



**Winlogbeat**

Lightweight shipper for Windows event logs



**Auditbeat**

Lightweight shipper for audit data

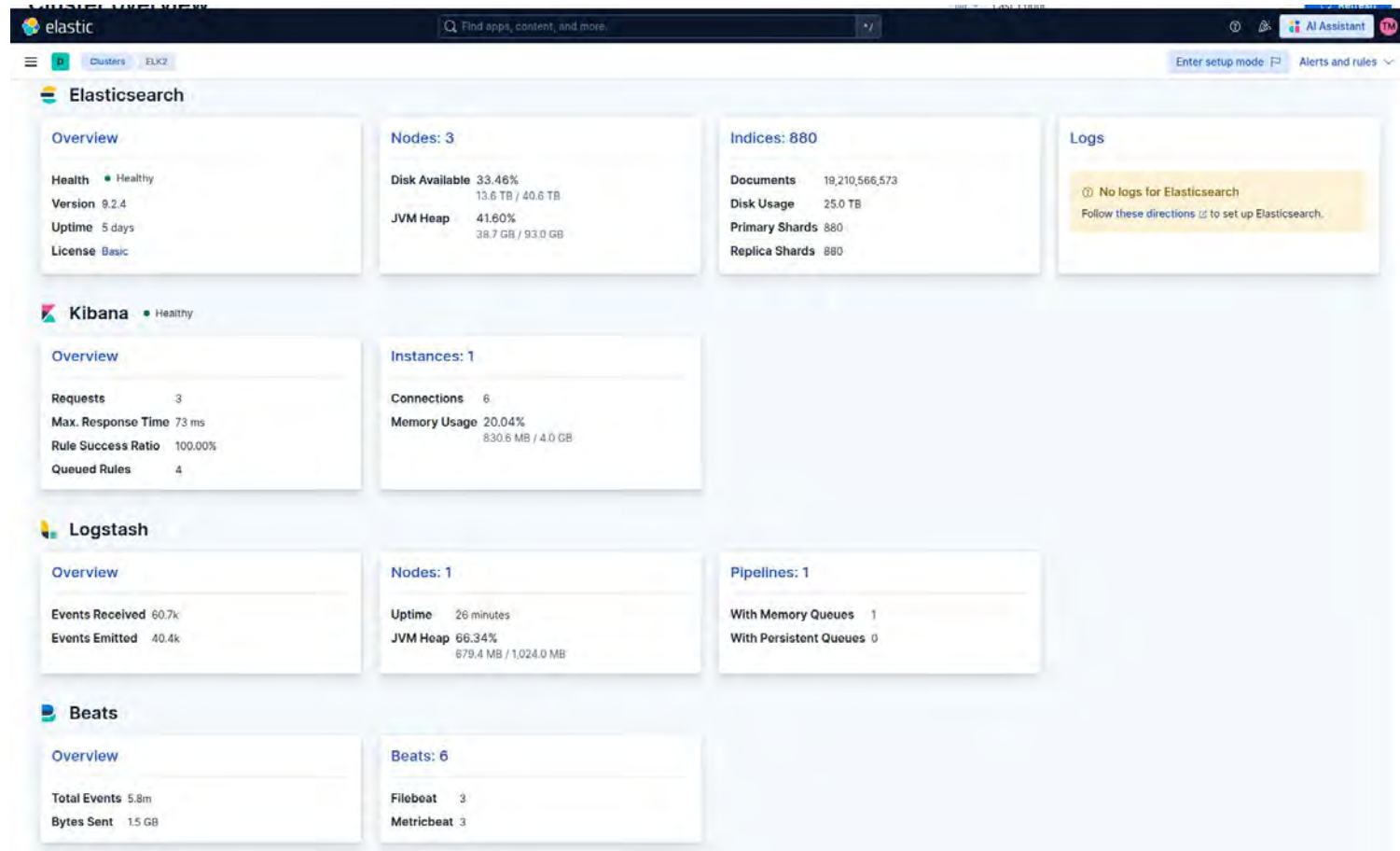


**Heartbeat**

Lightweight shipper for uptime monitoring



# Elastic Cluster Stats







# Other Tools

- NetDisco: <https://netdisco.org/>
  - Scan your network and find where and how devices are connected
- RANCID/Oxidized: <https://shrubbery.net/rancid/> <https://github.com/ytti/oxidized>
  - Backup your network hardware configurations
- LibreNMS: <https://www.librenms.org/>
  - Network monitoring system
- Nautobot: <https://docs.nautobot.com/projects/core/en/stable/>
  - Fork of Netbox that adds Ansible automation
- Uyuni: <https://www.uyuni-project.org/>
  - OS/package/patch/config management for Linux systems
- OpenSearch: <https://opensearch.org/>
  - Amazon's fork of Elastic (\*it's complicated)