

2024 State of Network Automation Survey

Survey Results

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AUTOCON 2

THE NETWORK AUTOMATION CONFERENCE

Agenda

- Intro
- Demographics
- The State of Network Automation
- Clues for More Automation
- Summary (and maybe Q&A)

Caveat Emptor



Second Year in a Row

2023 Results:



<https://youtu.be/0FN2B0Gtw0w?si=YhiCww0s4VQ8gi8E>

The 2024 Results Are In!

Who answered the survey?

- 106 Responses Total
- 20 Countries Represented
- 25 Different Types of Organizations
- 11 Distinct Job Roles/Functions
- Wide Range of Network Scale

Year over Year - High Level Numbers

2024:

- 106 Responses
- 20 Countries
- 25 Org Types
- 11 Job Roles
- Wide Range of Network Scale

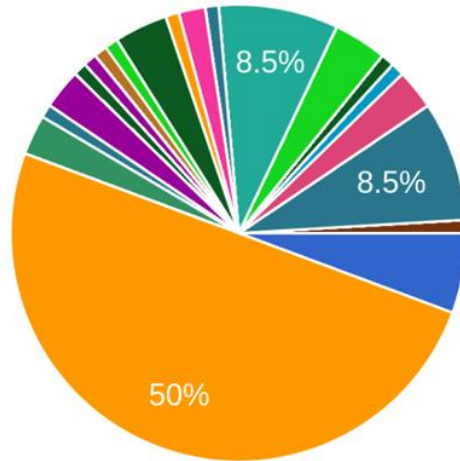
2023:

- 78 Responses
- 20 Countries
- 14 Org Types
- 9 Job Roles
- Wide Range of Network Scale

Who answered the survey (Country)?

In which country do you live?

106 responses



- Canada
- Mexico
- United States
- Afghanistan
- Akrotiri
- Albania
- Algeria
- American Samoa

Who answered the survey (Country)?

Australia - 3

Belgium - 1

Brazil - 3

Canada - 6

Costa Rica - 1

Denmark - 1

Finland - 1

France - 1

Germany - 4

Greece - 1

Ireland - 2

Italy - 1

Netherlands - 9

Norway - 4

Spain - 1

Sweden - 1

Switzerland - 3

United Kingdom - 9

United States - 53

Venezuela - 1

Year Over Year - Country Participation

2023 Only:

- Algeria
- India
- Indonesia
- Nigeria
- Philippines
- Singapore
- Tanzania

2024 Only:

- Belgium
- Brazil
- Costa Rica
- Finland
- Greece
- Switzerland
- Venezuela

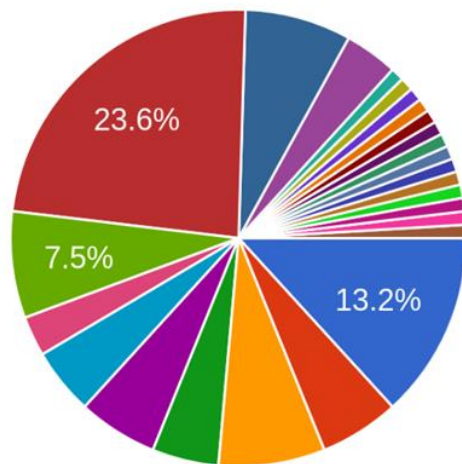
Both:

- Australia
- Canada
- Denmark
- France
- Germany
- Ireland
- Italy
- Netherlands
- Norway
- Spain
- Sweden
- United Kingdom
- United States

Who answered the survey (Org)?

What type of organization does "your" network support?

106 responses



- Internet Service Provider (ISP)
- Network Service Provider (NSP)
- Managed Service Provider (MSP)
- Public Cloud Operator (IaaS)
- Software as a Service Provider (SaaS)
- Content Delivery Network (CDN)
- Internet Exchange Point Fabric (IXP)
- Research and Education Network (REN)

▲ 1/4 ▼

Who answered the survey (Org)?

Enterprise IT Network	- 25	[13]
Internet Service Provider (ISP)	- 14	[23]
Other	- 14	[6]
Managed Service Provider (MSP)	- 8	[5]
Research and Education Network (REN)	- 8	
Higher Education	- 8	
Network Service Provider (NSP)	- 6	[8]
Software as a Service Provider (SaaS)	- 6	[7]
Content Delivery Network (CDN)	- 5	
Public Cloud Operator (IaaS)	- 5	[9]
Internet Exchange Point Fabric (IXP)	- 3	
Public Sector	- 4	[7]

Year Over Year - Organization Types

2024:

- Enterprise - 25
- ISP - 14
- Other - 14
- MSP - 8
- REN - 8
- Higher Education - 8
- NSP - 6
- SaaS - 6
- CDN - 5
- IaaS - 5
- IXP - 3
- Public Sector - 4

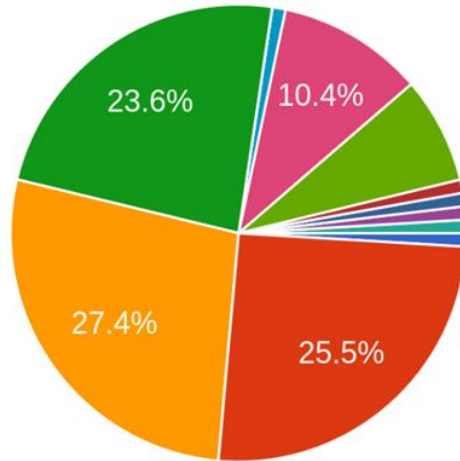
2023:

- ISP - 23
- Enterprise - 13
- IaaS - 9
- NSP - 8
- Public Sector - 7
- SaaS - 7
- MSP - 5
- Other - 6

Who answered the survey (Role)?

Which job function / role most closely matches your position?

106 responses



- Network Technician or Administrator
- Network Engineer or Operator
- Network Architect or Designer
- Network Automation Engineer or Dev...
- Cybersecurity Engineer or Analyst
- Peering Manager
- Network Team Manager or Director
- Executive Leadership

▲ 1/2 ▼

Who answered the survey (Role)?

Network Architect or Designer - 29 [21]
Network Engineer or Operator - 27 [19]
Network Automation Engineer or Dev - 25 [11]
Network Team Manager or Director - 11 [16]
Executive Leadership - 8 [7]
Other - 4 [4]
Network Technician or Administrator - 1 [0]
Peering Manager - 1 [0]
Cybersecurity Engineer or Analyst - 0

Year over Year - Respondent Role

2024:

- Network Architect - 29
- Network Engineer - 27
- **Automation Engineer - 25**
- Team Manager - 11
- Executive - 8
- Other - 4
- Network Admin - 1
- Peering Manager - 1

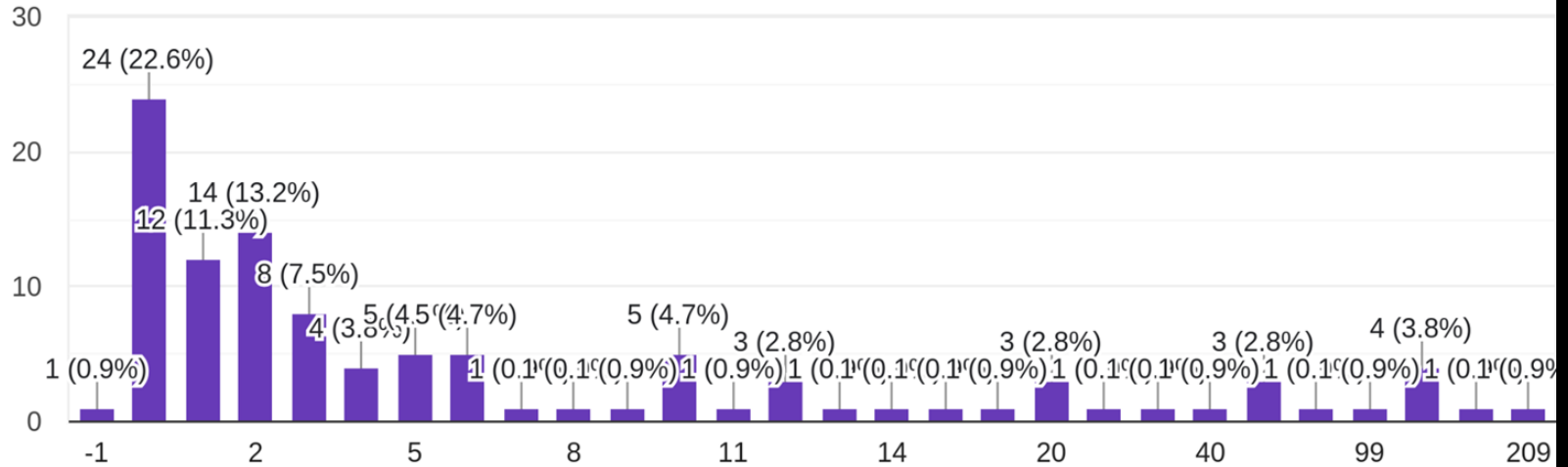
2023:

- Network Architect - 21
- Network Engineer - 19
- Team Manager - 16
- **Automation Engineer - 11**
- Executive - 7
- Other - 4

Who answered the survey (Scale)?

How many IX does your network connect to?

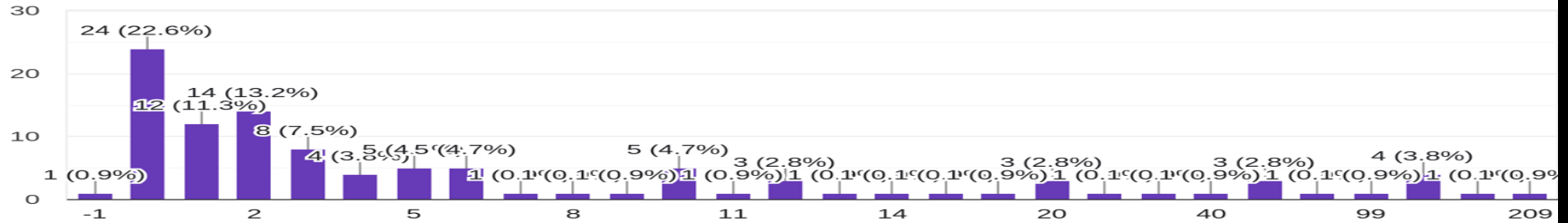
106 responses



Year over Year - Scale

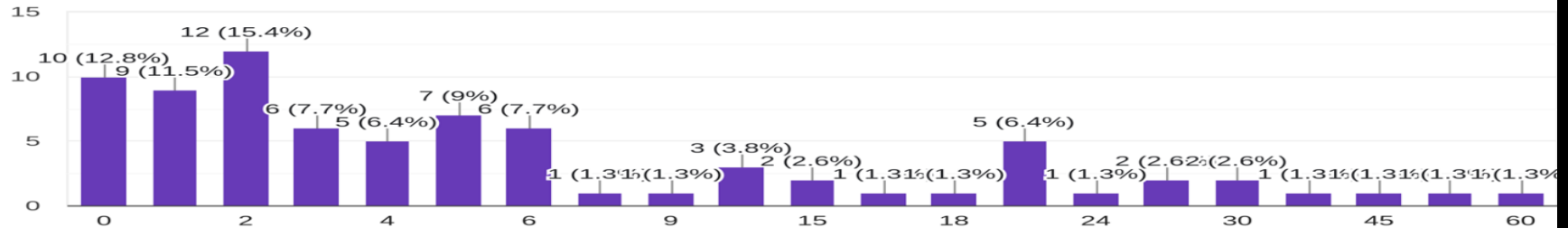
How many IX does your network connect to?

106 responses



How many IX does your network connect to?

78 responses



Who answered the survey (Scale)?

Number of IX:

Min: -1 [0]

Max: 209 [60]

Mean: 15.1 [8.7]

Median: 3 [4]

Number of Routers:

Min: -1 [2]

Max: 2MM [30,000]

Mean: 24,513 [1,918]

Median: 165 [93]

Who answered the survey (Scale)?

Number of IX:

Min: 0 [0]

Max: 209 [60]

Mean: 15.3 [8.7]

Median: 3 [4]

Number of Routers:

Min: 0 [2]

Max: 2MM [30,000]

Mean: 24,747 [1,918]

Median: 180 [93]

Who answered the survey (Scale)?

Number of Routers:

Min: 0 [2]

Max: 200K [30,000]

Mean: 5,754 [1,918]

Median: 165 [93]

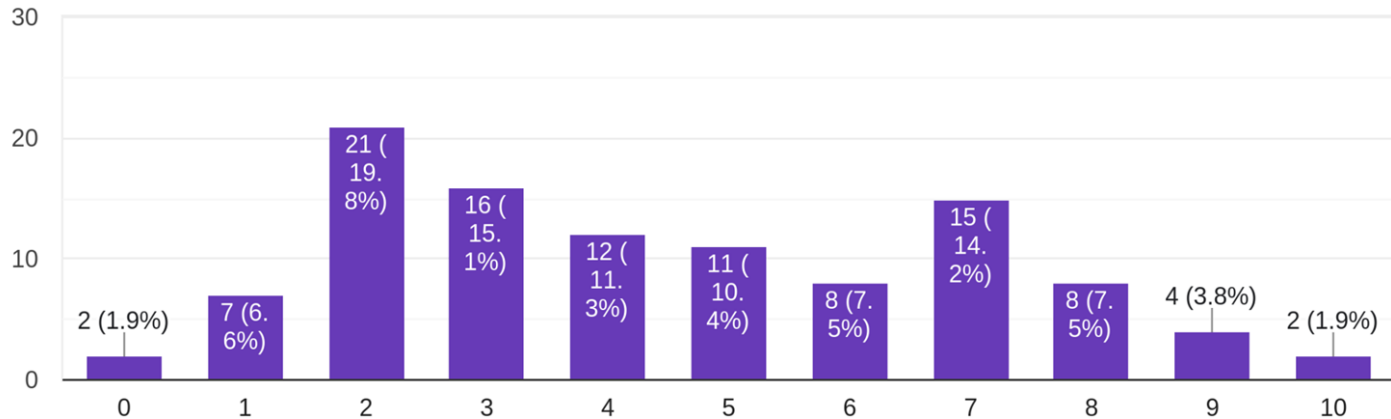
What did they say though?



How Automated Are We?

Thinking of the entire network lifecycle, from design through deployment and provisioning and on to maintenance and troubleshooting (including all po...): How much of your network is automated today?

106 responses



0%

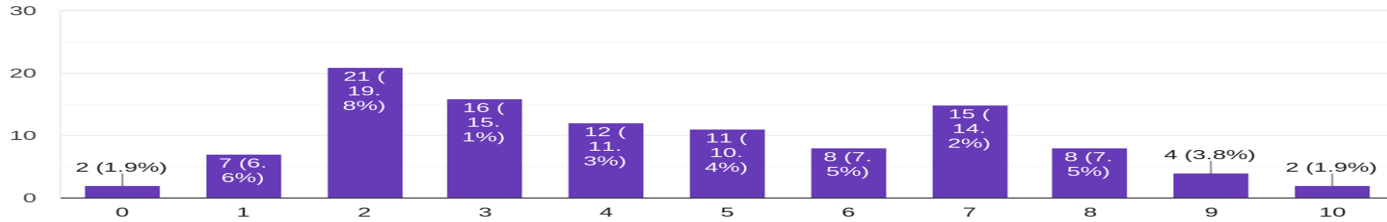
-
Nothing is automated, everything is always done manually.

100%

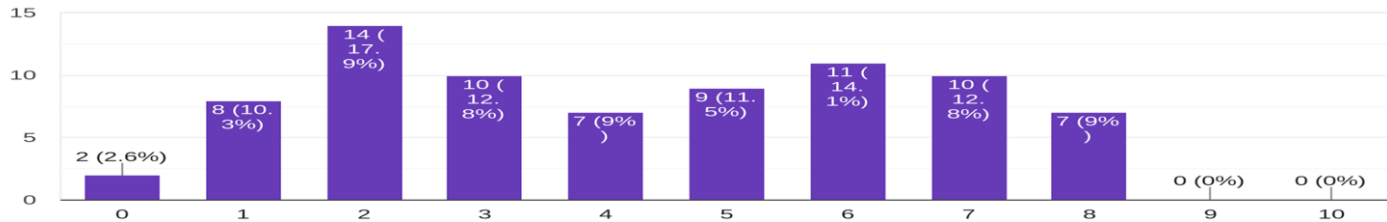
-
Everything is automated, nothing is ever done manually.

How Automated Are We?

Thinking of the entire network lifecycle, from design through deployment and provisioning and on to maintenance and troubleshooting (including all po...): How much of your network is automated today?
106 responses



Thinking of the entire network lifecycle, from design through deployment and provisioning and on to maintenance and troubleshooting (including all po...): How much of your network is automated today?
78 responses



0%

-
Nothing is
automated,
everything
is always
done
manually.

100%

-
Everything is
automated,
nothing is
ever done
manually.

So, How Automated Are We?

0%-20% = 19 [24]

30-40% = 28 [17]

50-60% = 19 [20]

70-80% = 23 [17]

90-100% = 6 [0]

50% & Below: 58 [50]

50% & Above: 48 [37]

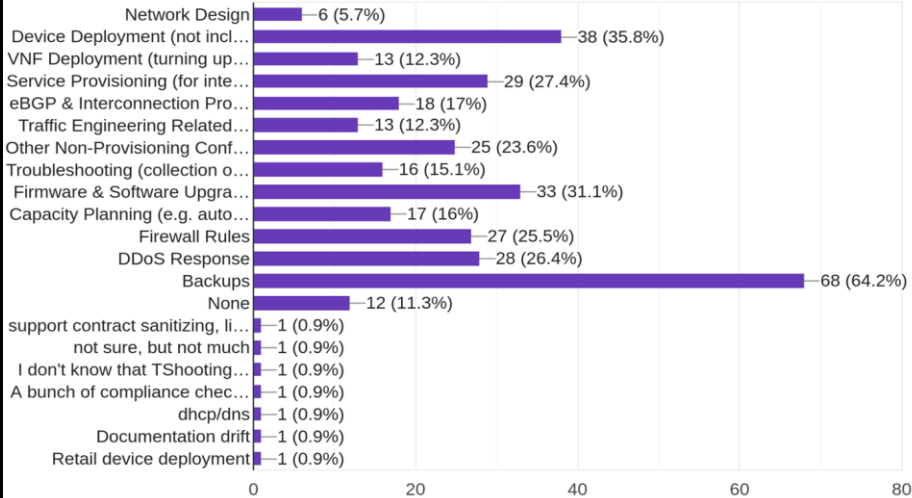
Mean: 44.6% [42.4%]

Median: 40% [40%]

What is Being Automated?

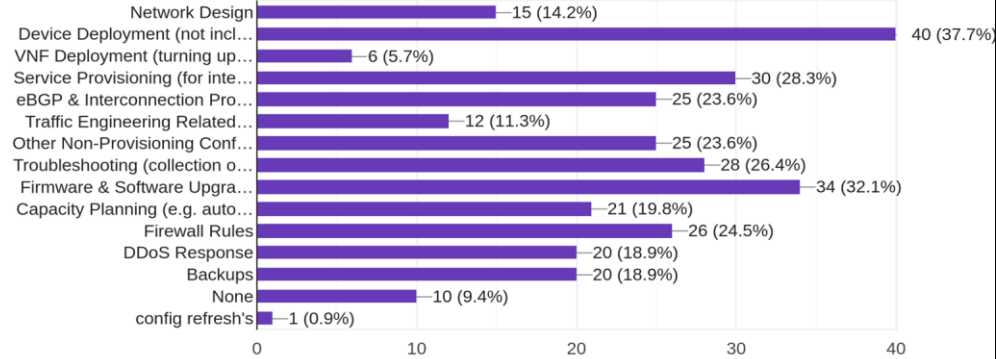
Which specific tasks and functions are fully automated in your network today? (Select all that apply)

106 responses



Which specific tasks and functions are partially automated in your network today? (Select all that apply)

106 responses



What is Being Automated?

1. Backups: $68+20=88$
2. Device Deployment: $38+40=78$ [58]
3. Firmware & Software Upgrades: $33+34=67$ [50]
4. Service Provisioning: $29+30=59$ [56]
5. Firewall Rules: $27+26=53$
6. Other Non-Provisioning Configuration Changes: $25+25=50$ [46]
7. DDoS Response: $28+20=48$
8. Troubleshooting - $16+28=44$ [39]
9. eBGP & Interconnection Provisioning: $18+25=43$ [35]
10. Capacity Planning: $17+21=39$ [41]
11. Traffic Engineering Related Configuration Changes: $13+12=25$ [24]
12. None: $12+10=22$ [9]
13. Network Design: $6+15=21$ [12]
14. VNF Deployment: $13+6=19$ [25]
15. Other: $10+0=10$

Year over Year - Being Automated

2024

Backups: $68+20=88$

Device Deployment: $38+40=78$

Firmware Upgrades: $33+34=67$

Service Provisioning: $29+30=59$

Firewall Rules: $27+26=53$

Other Non-Provisioning: $25+25=50$

DDoS Response: $28+20=48$

Troubleshooting - $16+28=44$

eBGP & Interconnection: $18+25=43$

Capacity Planning: $17+21=39$

Traffic Engineering: $13+12=25$

None: $12+10=22$

Network Design: $6+15=21$

VNF Deployment: $13+6=19$

Other: $10+0=10$

2023

Device Deployment: $26+32=58$

Service Provisioning: $31+25=56$

Firmware Upgrades: $22+28=50$

Other Non-Provisioning: $22+24=46$

Capacity Planning: $26+15=41$

Troubleshooting: $11+28=39$

eBGP & Interconnection: $22+13=35$

VNF Deployment: $17+8=25$

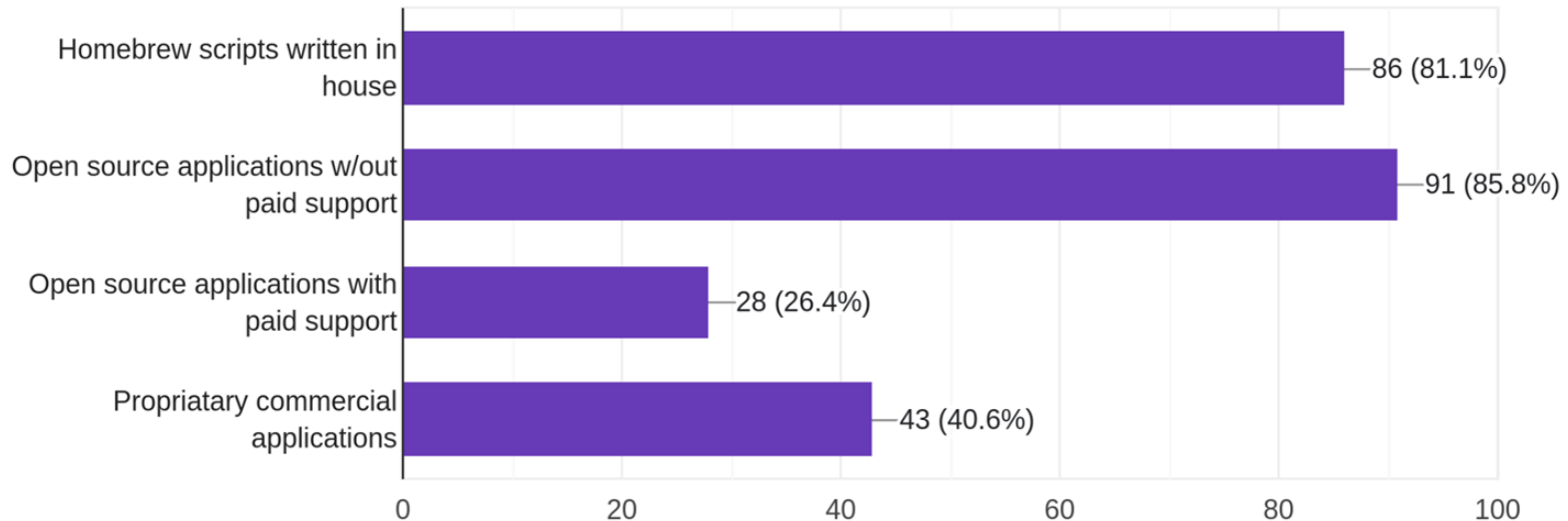
Traffic Engineering: $8+16=24$

Network Design: $2+10=12$

How Is It Being Automated?

What types of automation tools do you use in your network today? (Select all that apply)

106 responses



How Is It Being Automated?

OSS w/out support - 91 (86%) [78%]

“Homebrew” - 86 (81%) [89%]

Commercial app - 43 (41%) [31%]

OSS w/ paid support - 28 (26%) [17%]

Year over Year - How Automating

2024:

OSS no support - 91 (86%)

“Homebrew” - 86 (81%)

Commercial app - 43 (41%)

OSS w/ support - 28 (26%)

2023:

“Homebrew” - 69 (89%)

OSS no support - 61 (78%)

Commercial app - 24 (31%)

OSS w/ support - 13 (17%)

How Is It Being Automated (Languages)?

Python - 93 [73]

Shell (bash) - 22 [25]

Perl - 20 [24]

Go(lang) - 15 [13]

PHP - 8 [12]

Powershell - 8 [1]

Ansible - 7 [7]

Java(script) - 7 [0]

C - 3 [3]

Rust - 3 [1]

Expect - 2 [4]

Jinja(2) - 2 [1]

Terraform - 2 [0]

YAML - 2 [0]

Also mentioned:

API, Django, Gitlab, HCL,
HTML, Ruby, Salt, XML

How Is It Being Automated (OSS)?

Ansible - 50 [36]

Netbox - 24 [12]

Nautobot - 12 [5]

Git - 10 [3]

Nornir - 8 [5]

Rancid - 8 [3]

Python (& lib) - 7 [4]

Terraform - 7 [2]

Salt(stack) - 6 [4]

Napalm - 5 [5]

Netmiko - 4 [2]

Puppet - 3 [2]

Crossplane - 2

Docker - 2

Grafana - 2

Jenkins - 2

Jinja2 - 2

LibreNMS - 2

Oxidized - 2

Suzieq - 2

Zabbix - 2 [2]

How Is It Being Automated (\$W)?

Cisco - 14 (2 ACI, 7 DNA, 3 NSO) [10]

Ansible(tower) - 5 [4]

Nokia - 4 [4]

Solarwinds - 4

Netbox - 3

Github - 2

Itential - 2

Infoblox - 2

Juniper - 3 (2 Apstra, 1 Mist)

Microfocus - 2

ServiceNow - 2

VMware - 2

24 other companies/tools mentioned once.

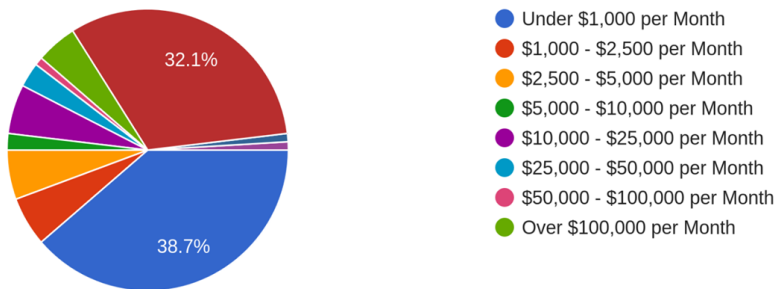
Paths to More Automation



Year over Year - Spending

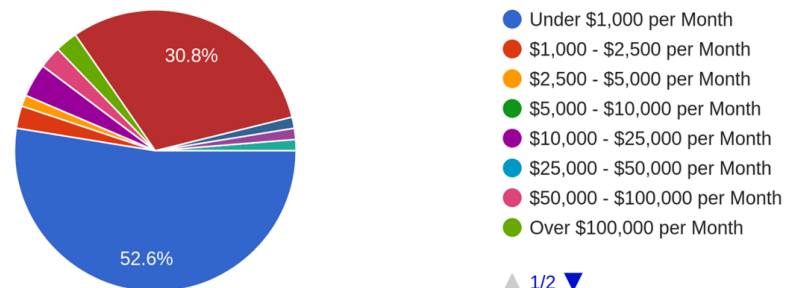
Roughly how much does your company spend on automation tooling each month? (Total costs across all application license fees, software support, etc.)

106 responses



Roughly how much does your company spend on automation tooling each month? (Total costs across all application license fees, software support, etc.)

78 responses



Year over Year - Spending

2024:

< \$1,000 Monthly: 39%

> \$1,000 Monthly: 29%

Don't Know / Opt Out: 32%

2023:

< \$1,000 Monthly: 53%

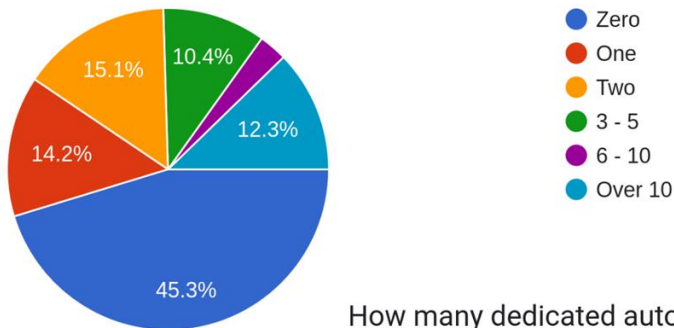
> \$1,000 Monthly: 16%

Don't Know / Opt Out: 31%

Year over Year - Staffing

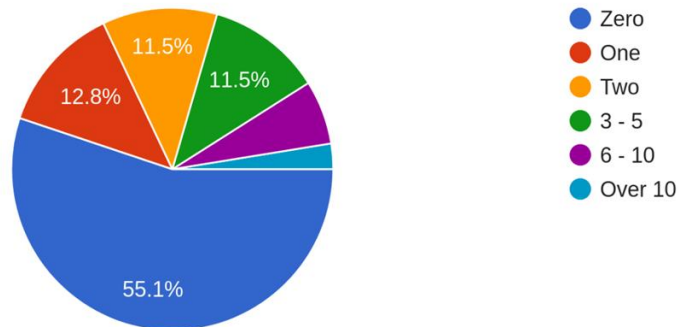
How many dedicated automation engineers work on your network?

106 responses



How many dedicated automation engineers work on your network?

78 responses



Year over Year - Staffing

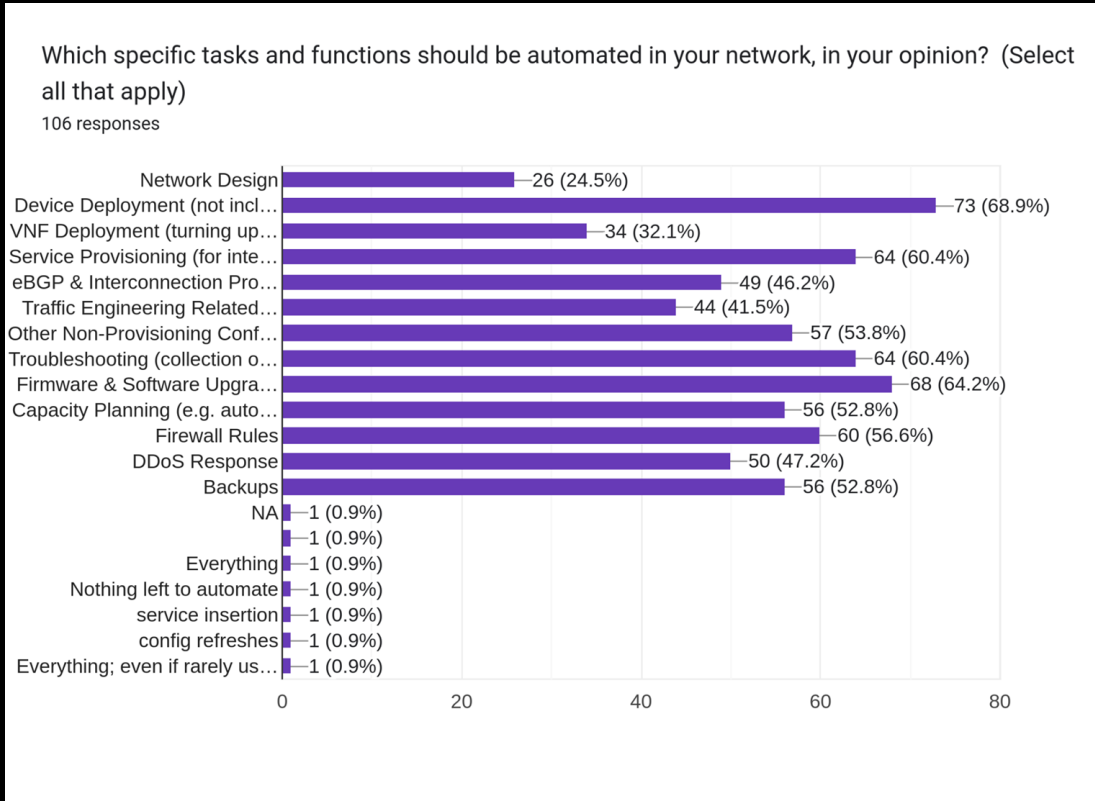
2024:

- Zero: 45%
- One: 14%
- Two: 15%
- 3 to 5: 10%
- > 5: 15%

2023:

- Zero: 55%
- One: 13%
- Two: 12%
- 3 to 5: 12%
- > 5: 9%

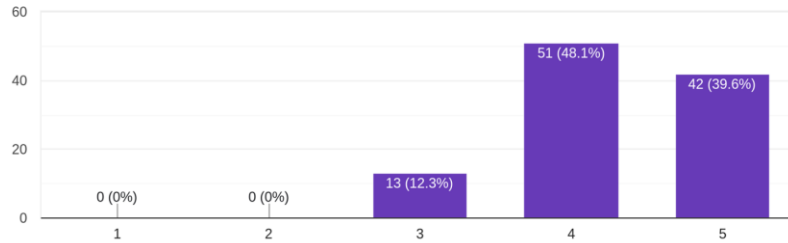
We still don't agree on Automation



Automation Skills Gap?

What is your level of networking knowledge?

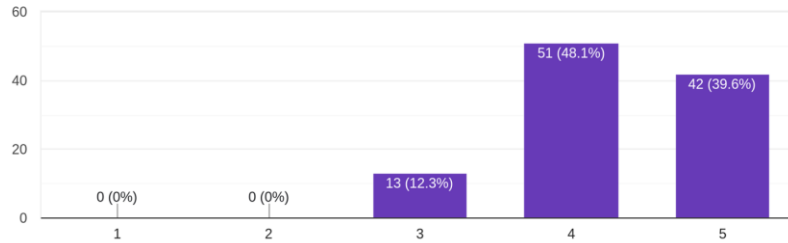
106 responses



Automation Skills Gap?

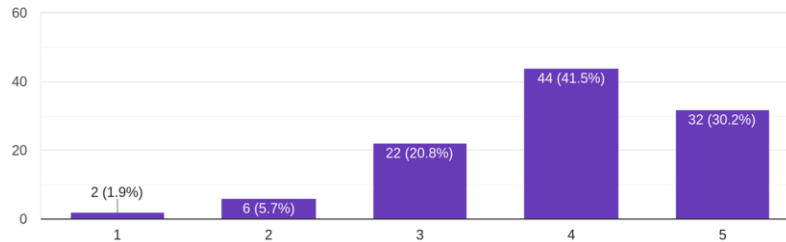
What is your level of networking knowledge?

106 responses



What is your level of interconnection knowledge?

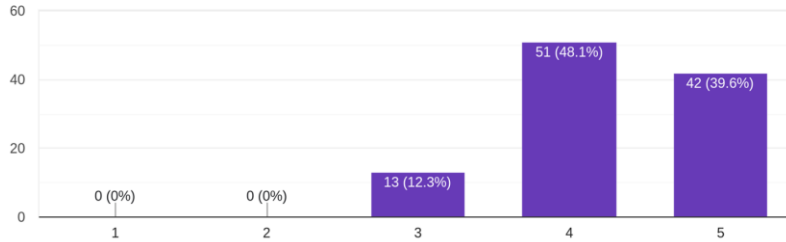
106 responses



Automation Skills Gap?

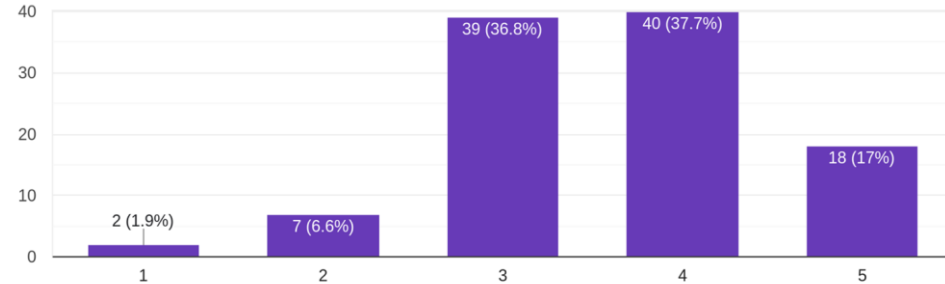
What is your level of networking knowledge?

106 responses



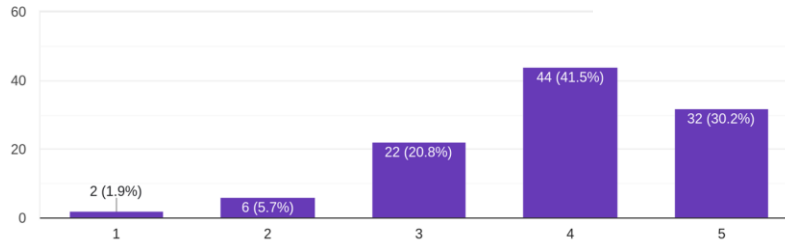
What is your level of network automation knowledge?

106 responses



What is your level of interconnection knowledge?

106 responses



Automation Skills Gap?

Knowledge?	1	2	3	4	5
Networking	0%	0%	12%	48%	40%
Interconnection	2%	6%	21%	42%	30%
Automation	2%	7%	37%	38%	17%

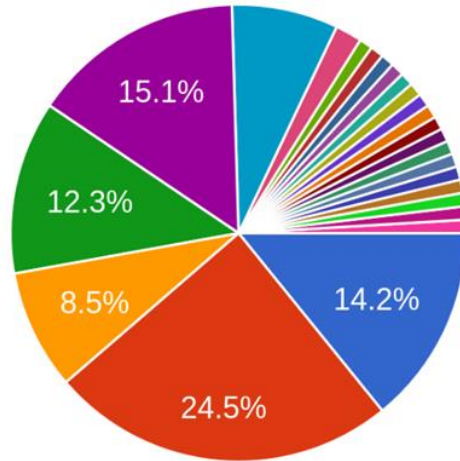
Automation Skills Gap?

Knowledge?	1-3	4-5
Networking	12%	88%
Interconnection	29%	72%
Automation	46%	45%

What's really holding us back?

What is the number one barrier to additional network automation adoption in your network?

106 responses



- Technical Challenges (e.g. devices wit...
- Skills Challenges (e.g. current staff do...
- Personality Challenges (e.g. network...
- Cultural Challenges (e.g. lack of colla...
- Organizational Challenges (e.g. lack o...
- Financial Challenges (e.g. no budget...
- Time
- Time - everything will eventually be au...

▲ 1/3 ▼

What's really holding us back?

Skills Challenges - 26 (25%)

Organizational Challenges - 16 (15%)

Technical Challenges - 15 (14%)

Cultural Challenges - 13 (12%)

Time - 10 (9%)

Personality Challenges - 9 (8%)

Financial Challenges - 8 (8%)

On “time”

- Available time and priorities
- Time - everything will eventually be automated
- Time needed to dedicate to automation
- Not enough time to pause... think about automating
- We operate lean and focus on keeping the lights on
- We build our entire automation tools ourselves, so the biggest problem is time
- Too many engineering projects to concentrate on some aspects of automation

What's really holding us back?

Skills Challenges - 26 (25%)

“People” Challenges - 38 (36%)

Technical Challenges - 15 (14%)

Time - 10 (9%)

Financial Challenges - 8 (8%)



#SchittsCreek



What Did He Just Say?

Highlights

106 Diverse Responses

40% of Network Automated (Median)

86%+ Using OSS && 81% “Homebrewing”

41% Using Commercial App (up from 31%)

98%+ Using Python && 47%+ Ansible

45% of Orgs have No Dedicated Automation Staff (down from 55%)

“People” (36%) & Skills (25%) are top challenges (with technical at 14%)



Thank You!!!