

# Cloud Metro 2023 Survey Results

## A Heavy Reading survey for Juniper Networks

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**Sterling Perrin**  
Senior Principal Analyst

**June 2023**

# Agenda

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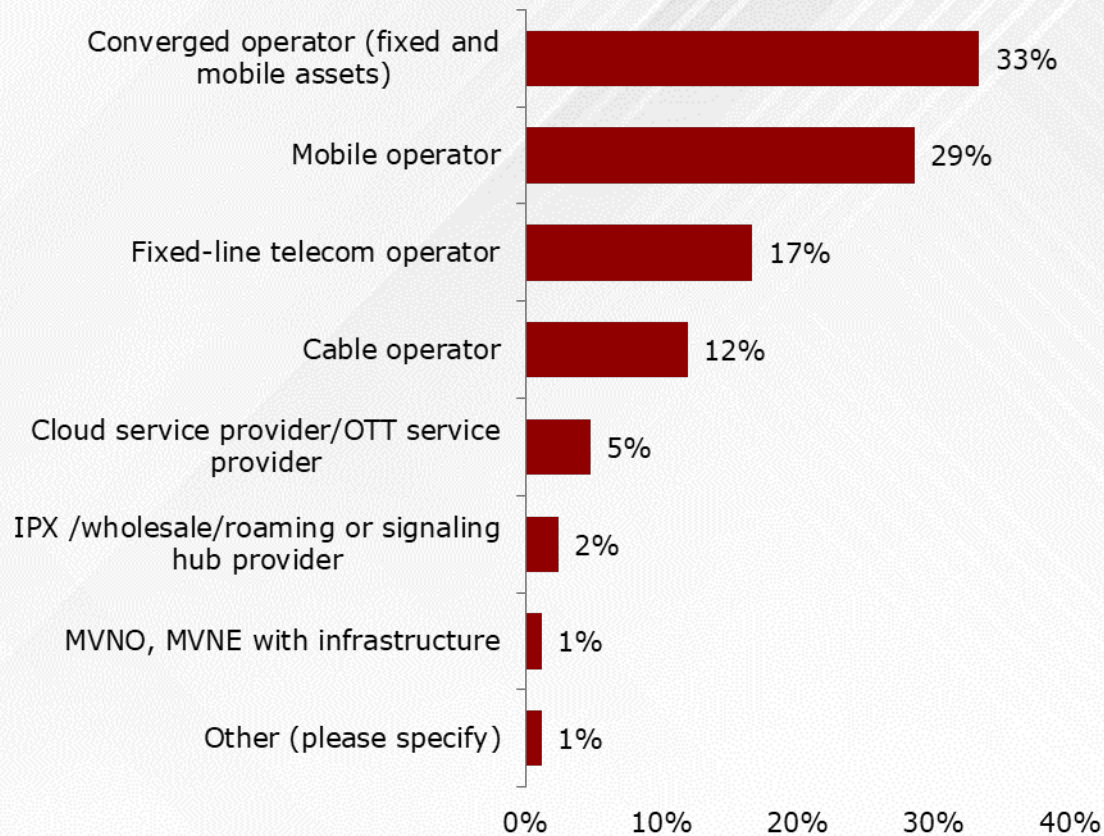
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# Survey demographics

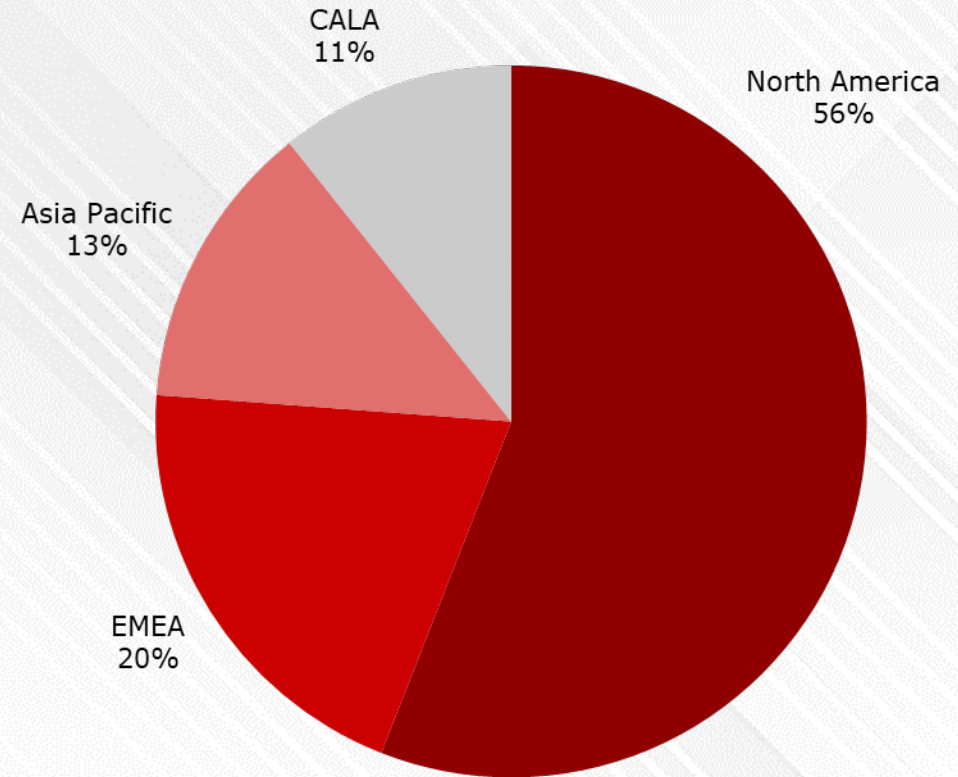
# Demographics (1/3)

### Type of service provider



n=84  
Source: Heavy Reading

### Geographic region

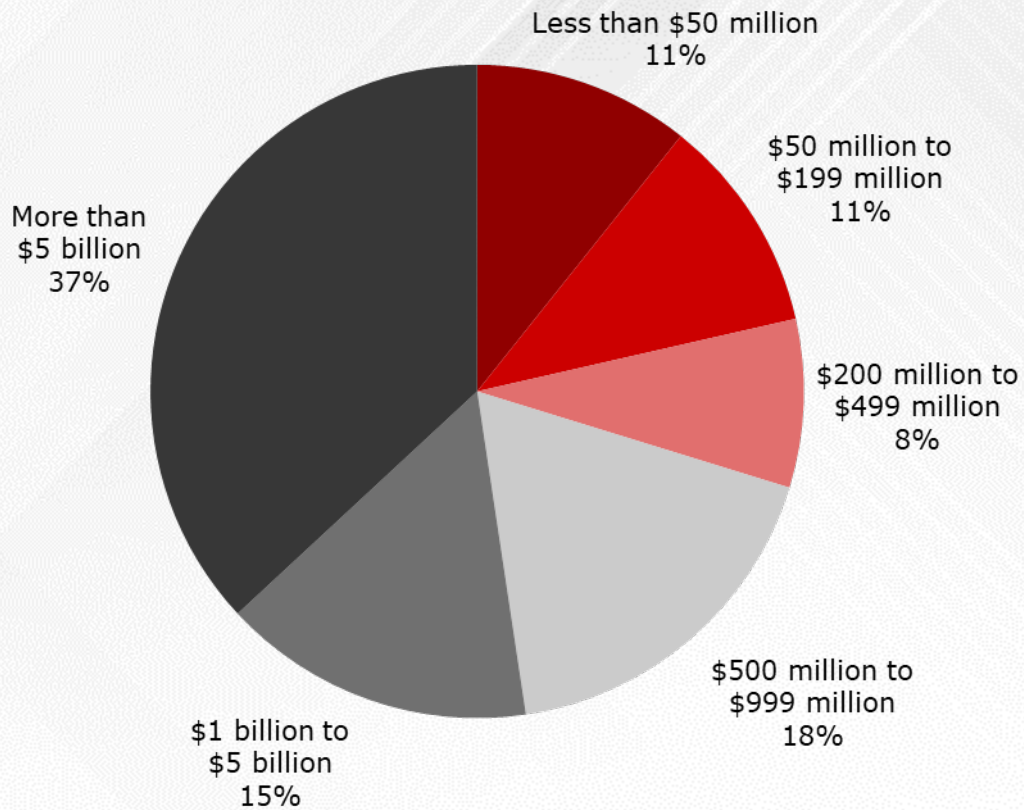


n=84  
Source: Heavy Reading

Note: Numbers in figures throughout this report may not total 100 due to rounding.

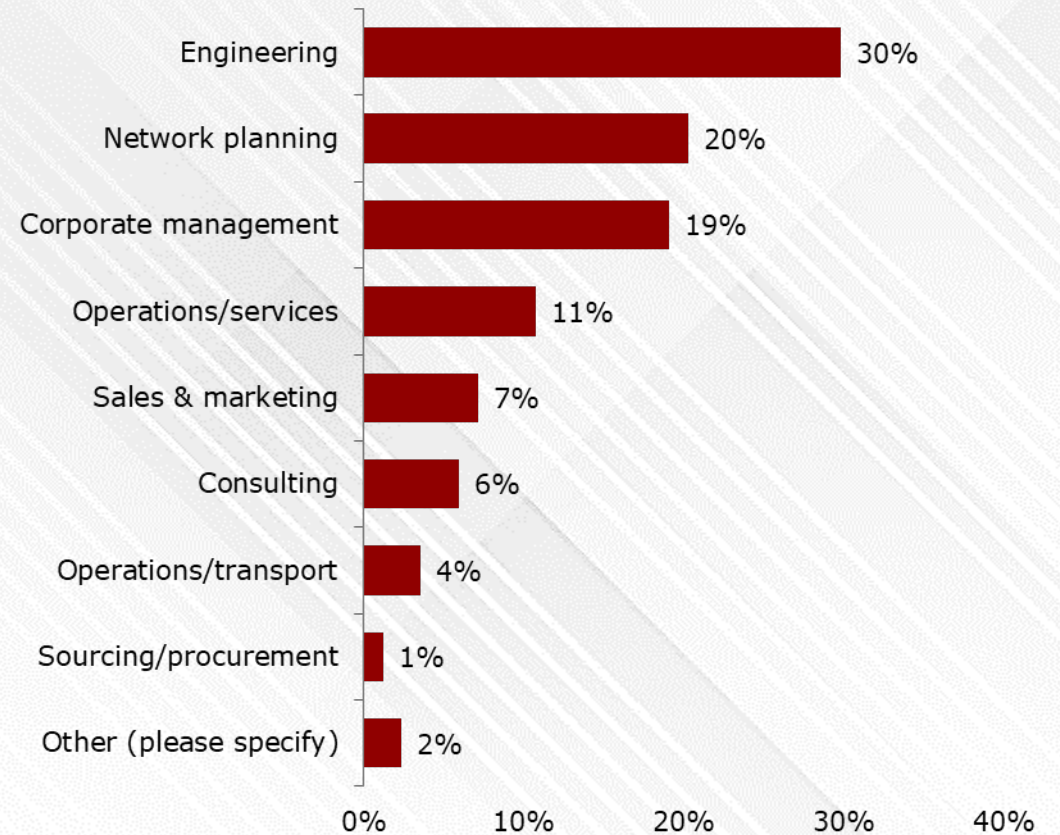
# Demographics (2/3)

### Annual revenue



n=84  
Source: Heavy Reading

### Job function\*

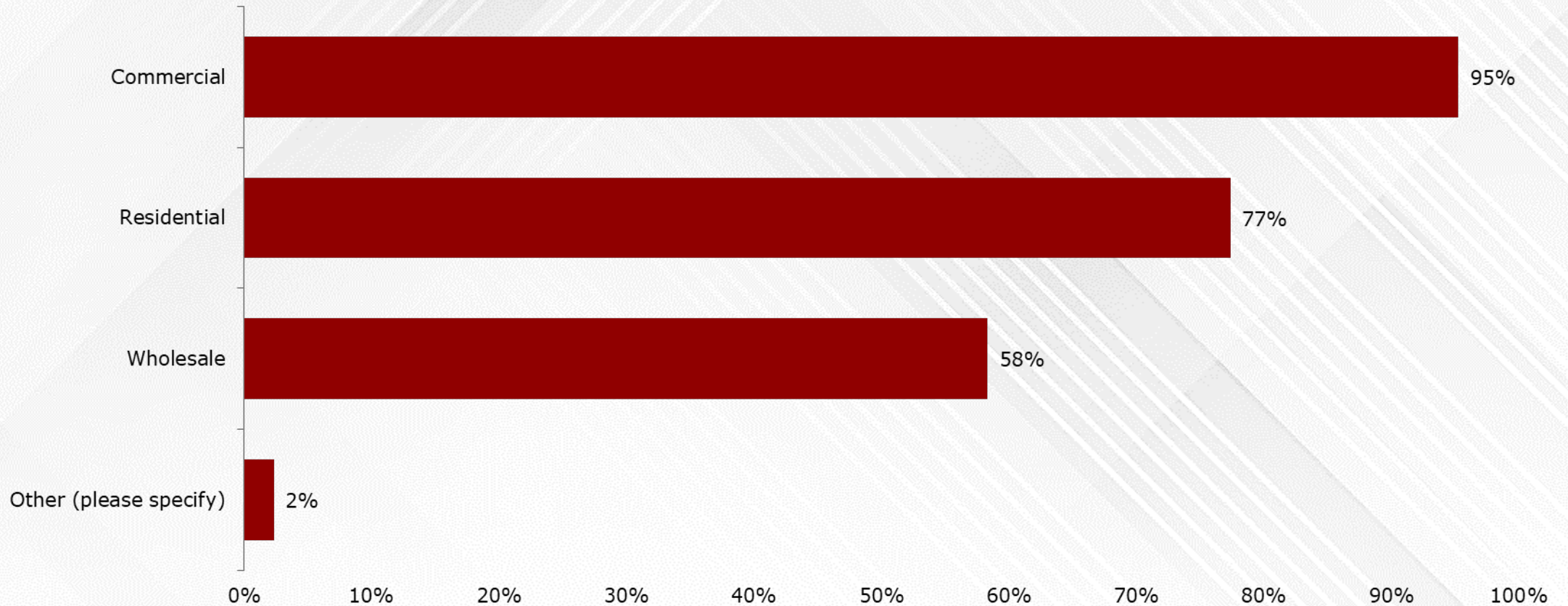


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Source: Heavy Reading

\*100% involved in network planning and/or purchasing

# Demographics (3/3)

### What types of customers does your network serve?



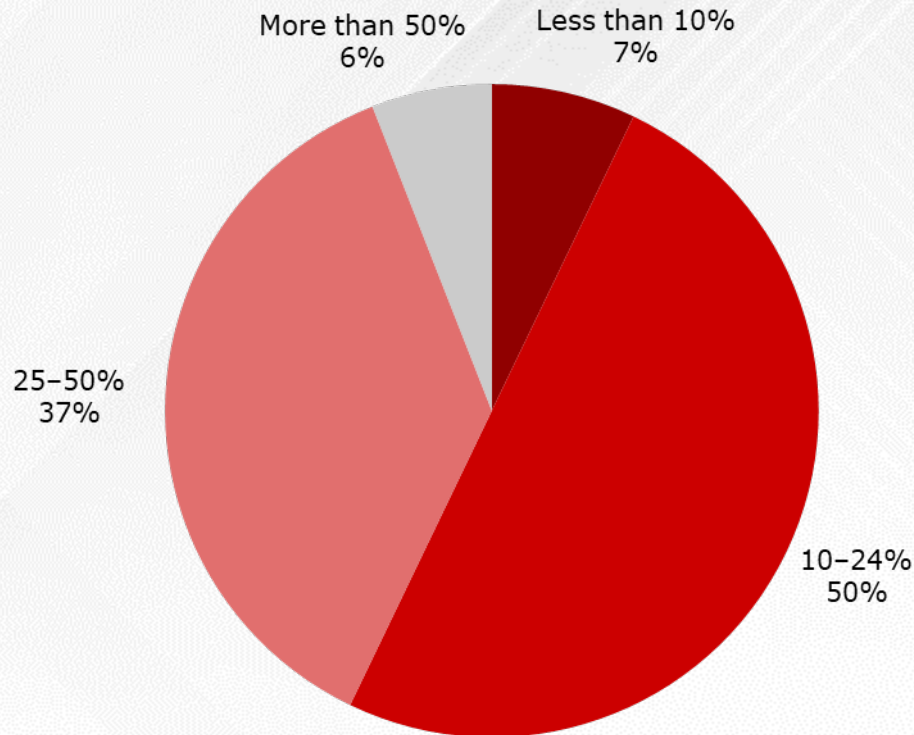
n=84  
Source: Heavy Reading



# Network modernization

# Metro traffic growth expectations

How much do you anticipate your metro traffic to grow per year over the next five years?



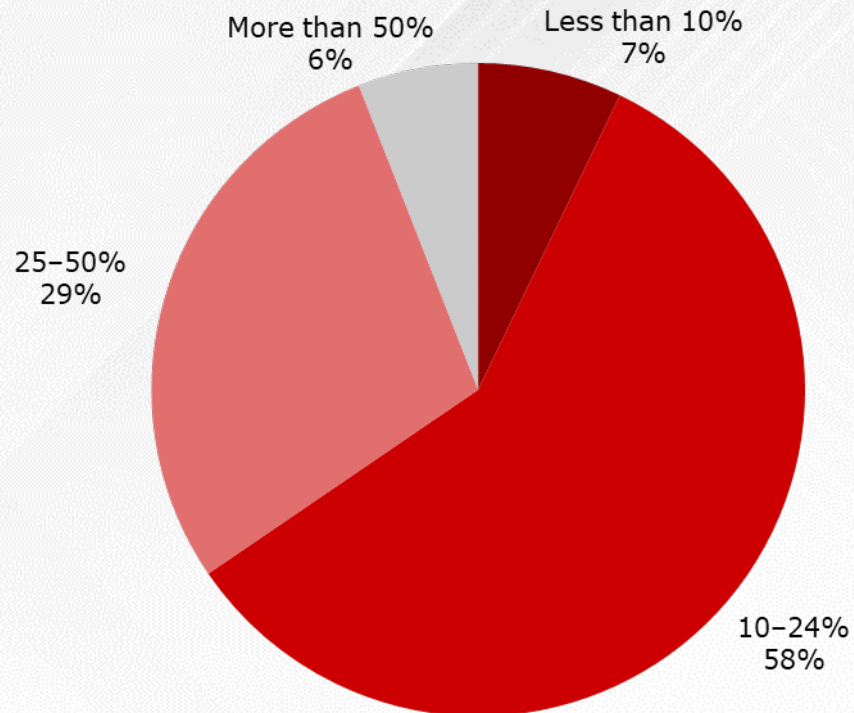
- Half of communications service providers (CSPs) expect 10–24% annual growth in metro traffic
- 43% expect annual metro traffic growth of 25% or greater
- Comparing 2023 results to 2022:
  - 2023 data is closely aligned with the 2022 survey
  - Indicates consistent expectations for traffic growth

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Source: Heavy Reading



# Changing metro network traffic patterns

**What percent of overall metro traffic do you expect east-west traffic to account for over the next three years?**

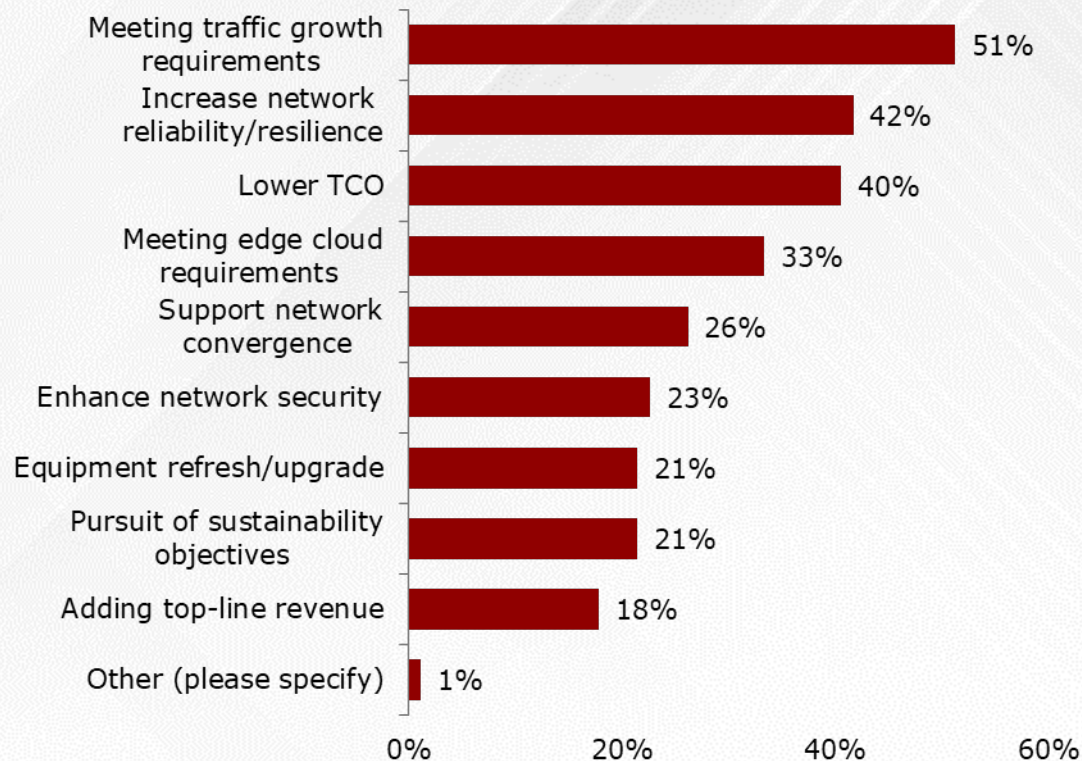


n=84  
Source: Heavy Reading

- East-west describes traffic between data centers in a metro
- 58% of CSPs expect east-west will account for 10–24% of metro traffic annually
- 35% expect east-west traffic will account for 25% of metro traffic or greater
- Comparing 2023 results to 2022:
  - 2023 data is closely aligned with the 2022 survey
  - Indicates consistent expectations for east-west traffic

# Metro network modernization business drivers

## What are the primary business drivers to modernize your metro network?



n=84  
Source: Heavy Reading

- At 51%, meeting traffic growth requirements is the top driver
- Increasing network reliability/resilience (42%) and lowering total cost of ownership (TCO) (40%) are also highly important drivers for modernization
- Sustainability is a buzzword in 2023 and was added as an option for the 2023 survey
  - Surprisingly, it registered low on the list as a primary driver
- Comparing 2023 results to 2022:
  - Traffic growth and reliability were the top two named business drivers in both 2023 and 2022

# Metro network modernization use case drivers

**What are the main application/use case drivers for modernizing your metro network?**

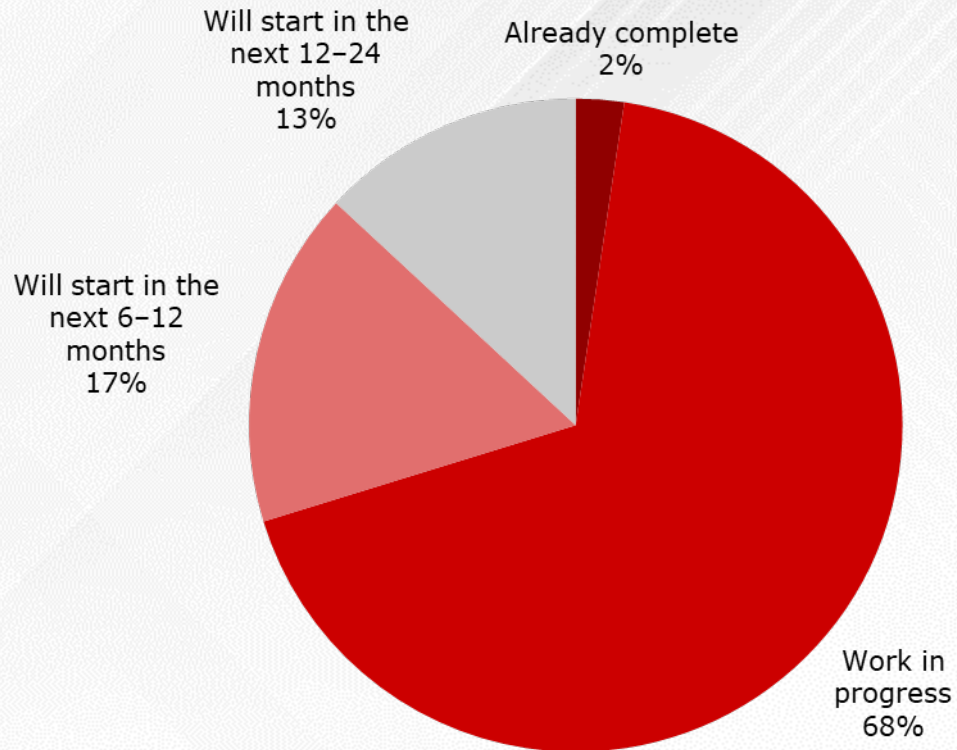
Driver	Score	Overall rank
5G	141	1
Edge/cloud services	133	2
Enterprise services (including SD-WAN)	87	3
Residential broadband	75	4
IoT (Internet of Things)	68	5

n=84  
Source: Heavy Reading

- 5G ranks first as the business driver for modernization
- Edge/cloud ranks second and well ahead of other the remaining drivers listed
- Comparing 2023 results to 2022:
  - 5G and edge/cloud were also the top two choices last year
  - Residential broadband rose from fifth in 2022 to fourth position in 2023

# Metro modernization timelines

## What is the timeline for your metro network modernization project?

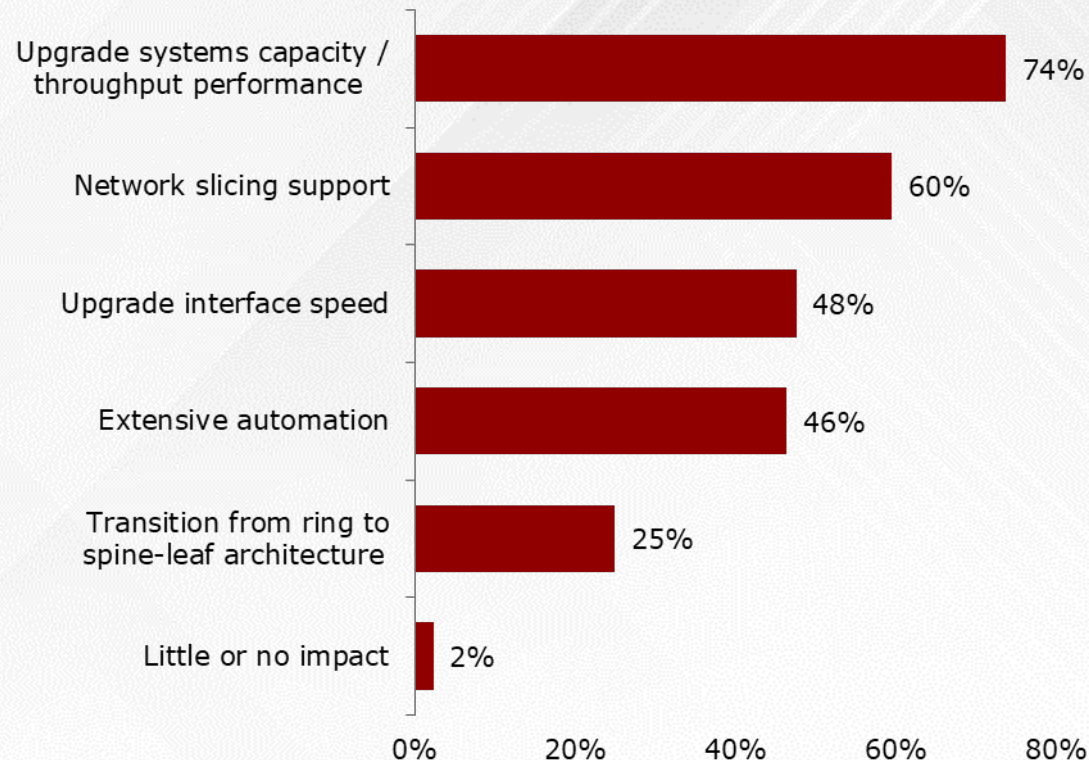


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Source: Heavy Reading

- For the majority (68%), metro modernization is a work in progress
- For 30%, projects are planned but have not begun
  - 17% plan to begin in the next 6-12 months
  - 13% plan to begin in the next 12-24 months
- Comparing 2023 results to 2022:
  - Share of CSPs planning modernization in the near term is on the rise (starting in the next 6-12 months)

# Expected impacts from edge cloud deployments

## What are the primary impacts that edge cloud deployments will have on your metro network?



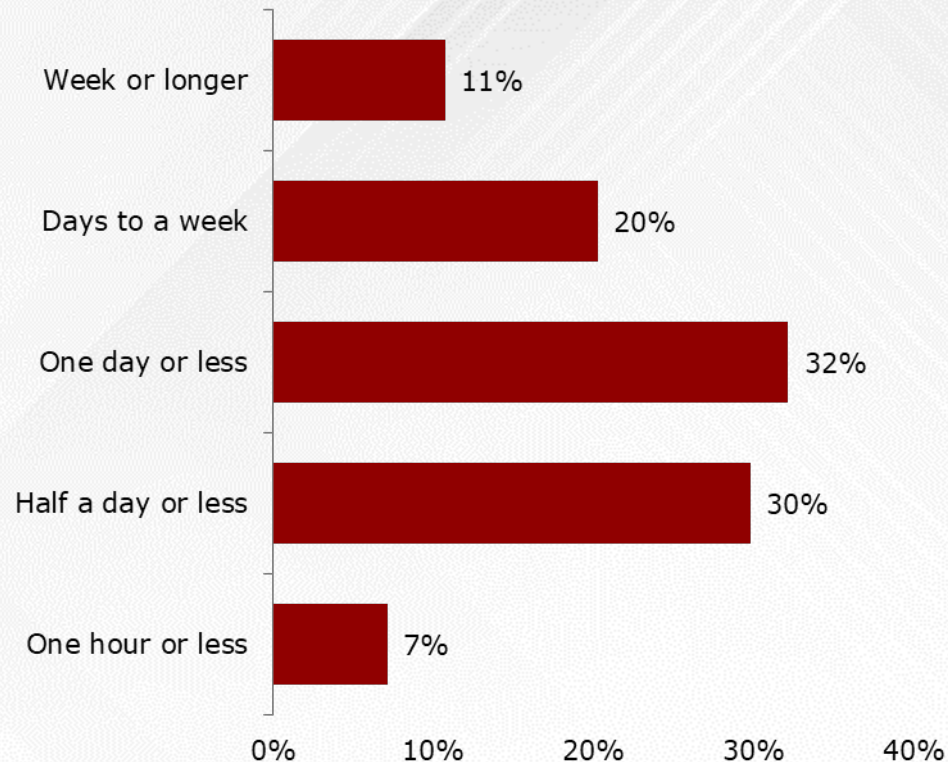
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Source: Heavy Reading

- Selected by 74%, upgrading system capacity/ throughput performance is the biggest expected impact
  - As edge puts more data within the metro, the metro network will have to scale
- Network slicing support ranks second at 60%
- Upgrading interface speeds and extensive automation are expected by many CSPs
- Comparing 2023 results to 2022:
  - Largely in line, but network slicing rises a notch in 2023
  - Result could indicate that slicing is getting a bit more “real” for many operators

# Onboarding metro networking devices

## How long does it take for your team to onboard a metro networking device?



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Source: Heavy Reading

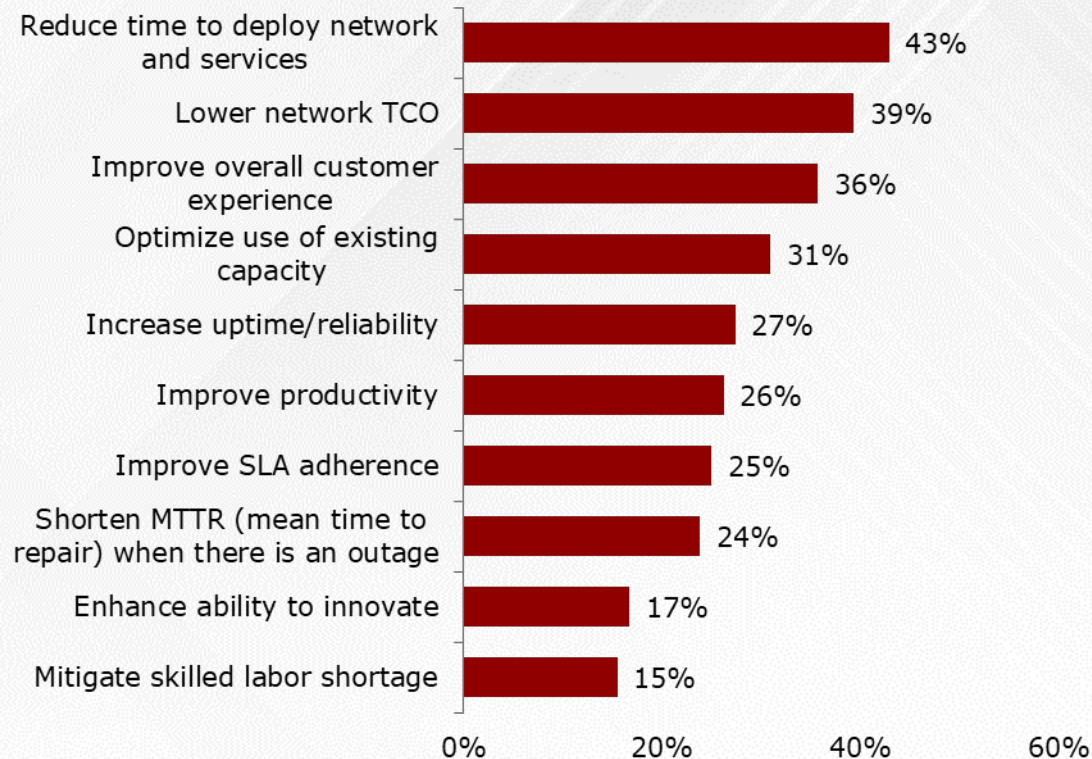
- 93% take more than one hour to onboard metro devices today
  - Just 7% onboard devices in less than one hour
- 31% take days or longer to onboard metro devices
- Results indicate a lot of room for improvement in device onboarding time (and money)
- Comparing 2023 results to 2022:
  - 2023 results show moderately longer onboarding times across the board compared to 2022



# Network automation

# Metro network automation drivers

## What are the primary drivers for implementing automation in your metro network?



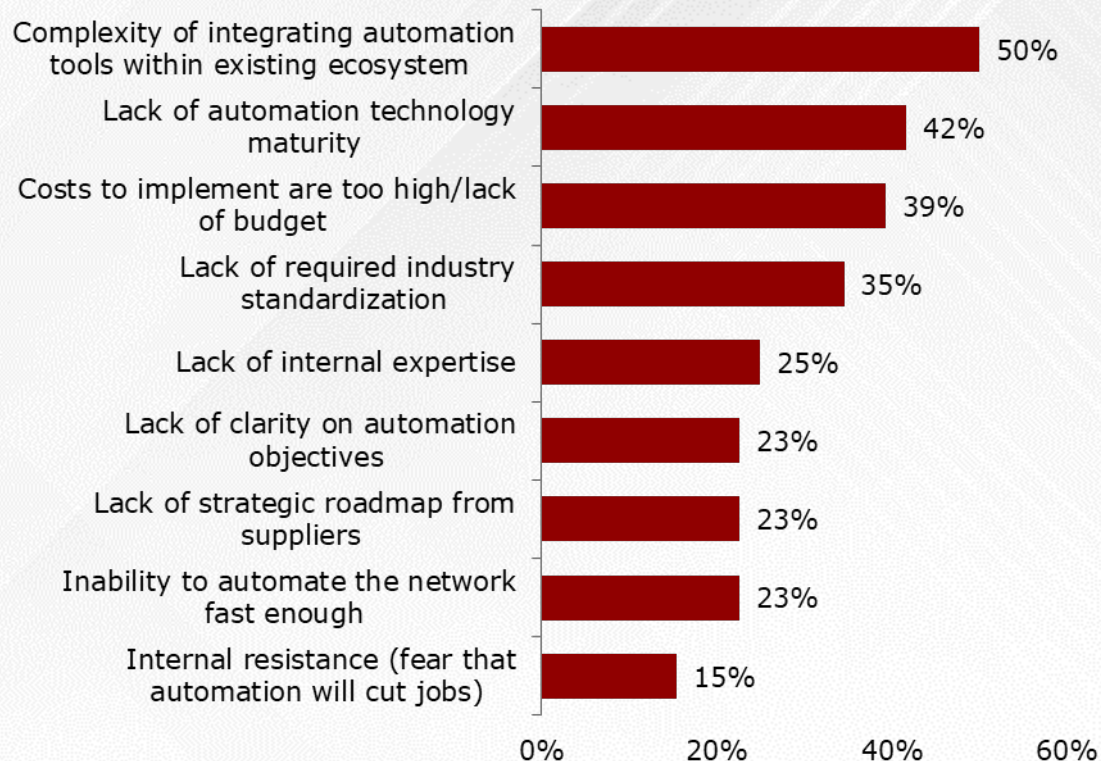
n=84  
Source: Heavy Reading

- Three drivers for automation rise to the top:
  - Reducing time to deploy network and services (43%)
  - Lowering network TCO (39%)
  - Improving overall customer experience (36%)
  
- Although commonly discussed, using automation to address labor shortages ranked last on the list (selected by just 15%)
  
- Comparing 2023 results to 2022:
  - 2023 survey introduced several new options, making year-to-year comparison difficult
  - That said, reducing time to deploy was the top choice for both years



# Metro network automation challenges

## What are the biggest challenges to achieving your metro network automation strategy?

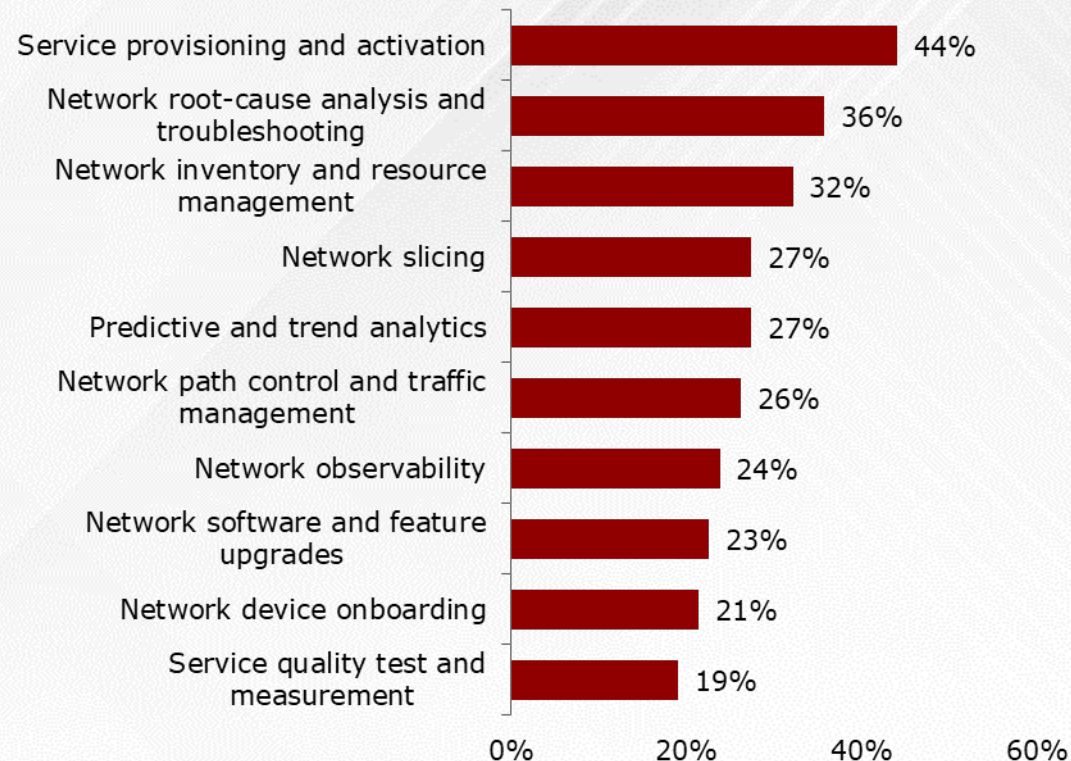


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Source: Heavy Reading

- Complexity stands out as the primary automation challenge
  - Automation requires a major network shift to multi-vendor interop and openness
  - The tools and processes for managing these networks are not in place
- Lack of automation technology maturity and high costs to implement are also major hurdles
- Comparing 2023 results to 2022:
  - 2023 survey introduced three new options, but the top five options and order remain identical to 2022
  - The automation vs. jobs debate does not resonate with this CSP audience

# Primary automation use cases for metro networks

## What are the primary use cases for metro network automation over the next three years?



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Source: Heavy Reading

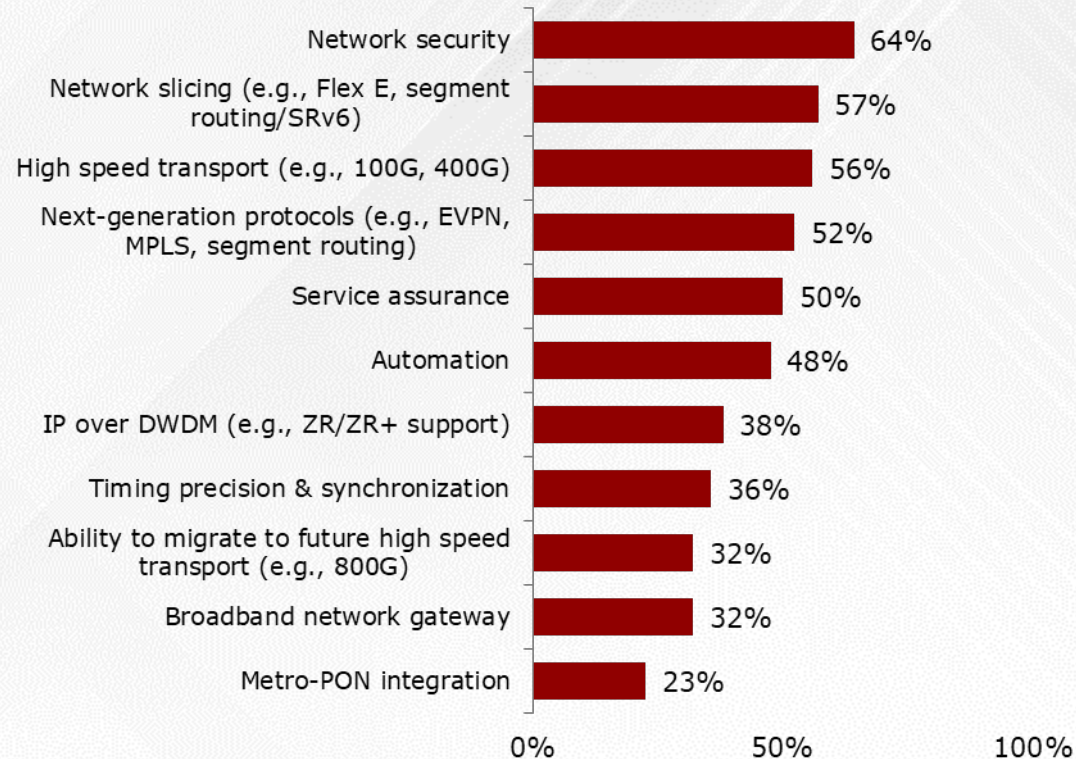
- At 44%, a plurality identified service provisioning and activation as the top automation use case
- Network root-cause analysis/troubleshooting and network inventory/resource management are also highly important
- Many use cases (including slicing) scored in the 20%+ range for the year-to-year time period given
- Comparing 2023 results to 2022:
  - Many options were changed in 2023, but service provisioning and activation was the top use case choice in both surveys



# Features & functions

# Most important metro networking capabilities

## Which are the most important metro networking capabilities?

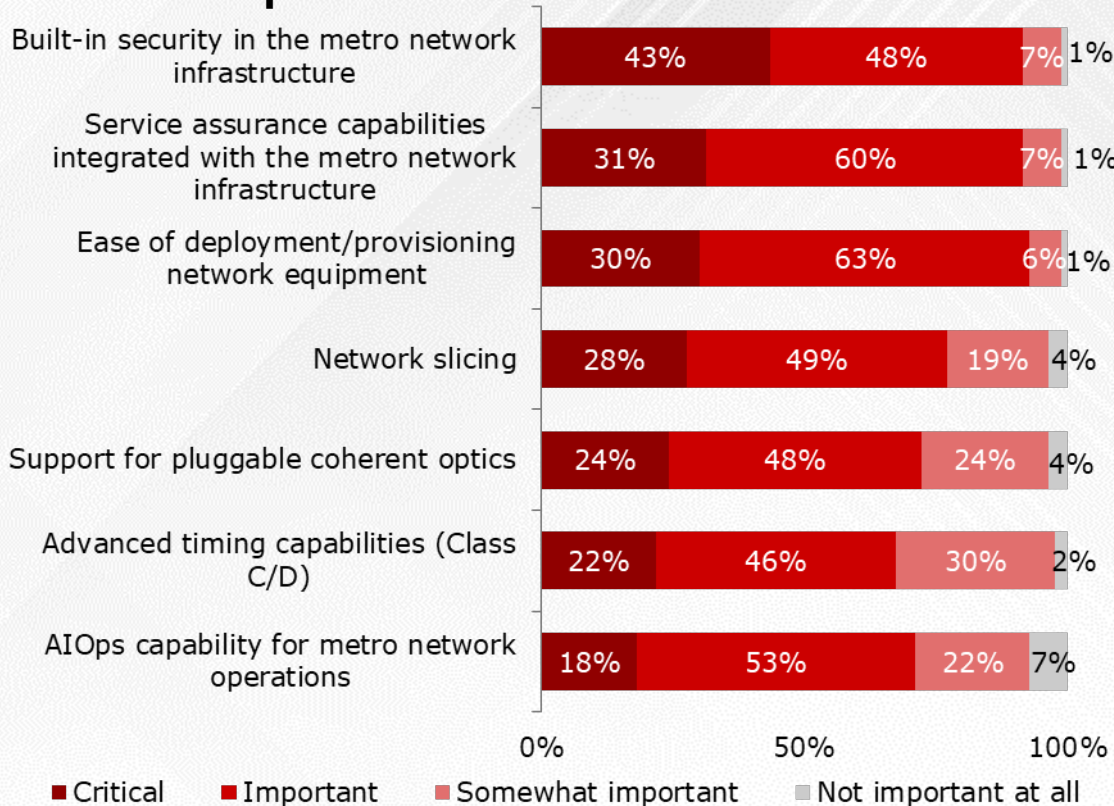


- Network security tops the list of most important capabilities (selected by 64%)
- Network slicing (57%), high speed interfaces (56%), next-gen protocols (52%), service assurance (50%), and automation (48%) are all highly important
- Comparing 2023 results to 2022:
  - Security topped the list in both surveys
  - Slicing moved up a bit in 2023, while automation moved down a bit
  - IP over DWDM (IPoDWDM) scored the same for both years (38%)

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Source: Heavy Reading

# Importance of metro networking capabilities

## How important are the following metro network capabilities?

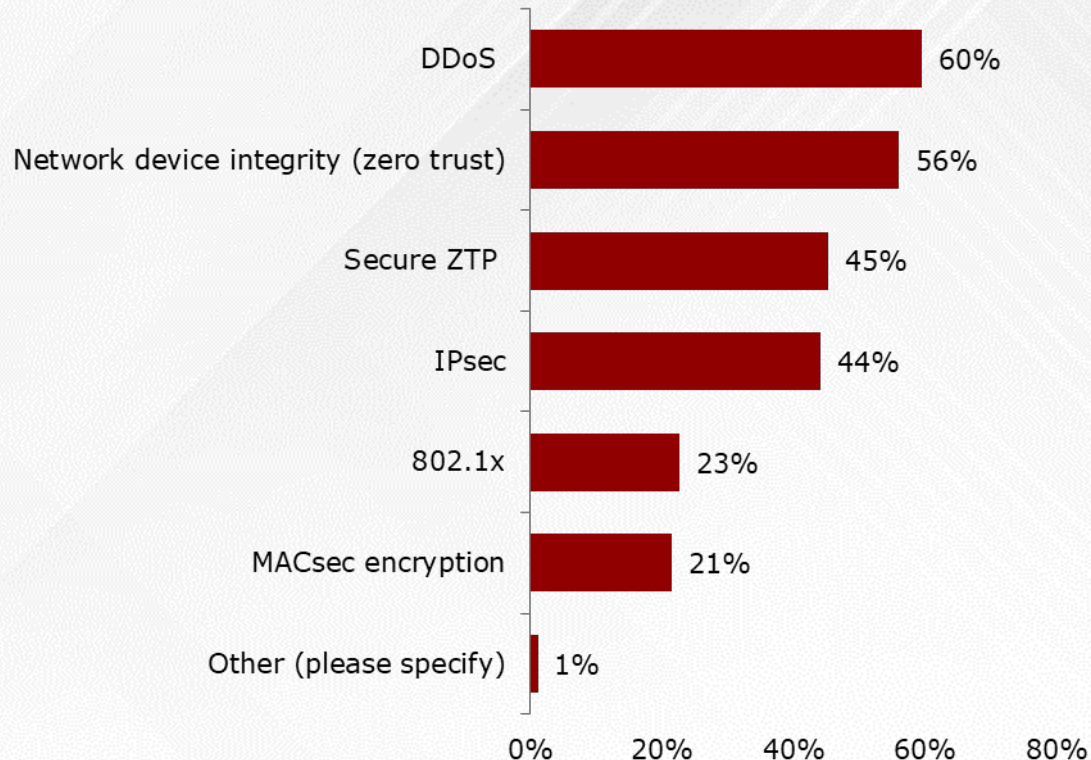


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Source: Heavy Reading

- Given changes to this question in 2023, there is some overlap with the results shown on the previous slide
- Built-in security ranks the highest among the choices, selected as “critical” by 43% of CSPs
- Service assurance capabilities (“critical” for 31%) and ease of deployment (“critical” for 30%) are viewed virtually identically in terms of importance
- Artificial intelligence for network operations (AIOps)—among the big buzzwords of 2023—ranks at the bottom of the priority list
- Comparing 2023 results to 2022:
  - Many options were changed in 2023, but built-in security is still the top use case choice in both surveys

# Important built-in security features

## Which built-in security features are most important?

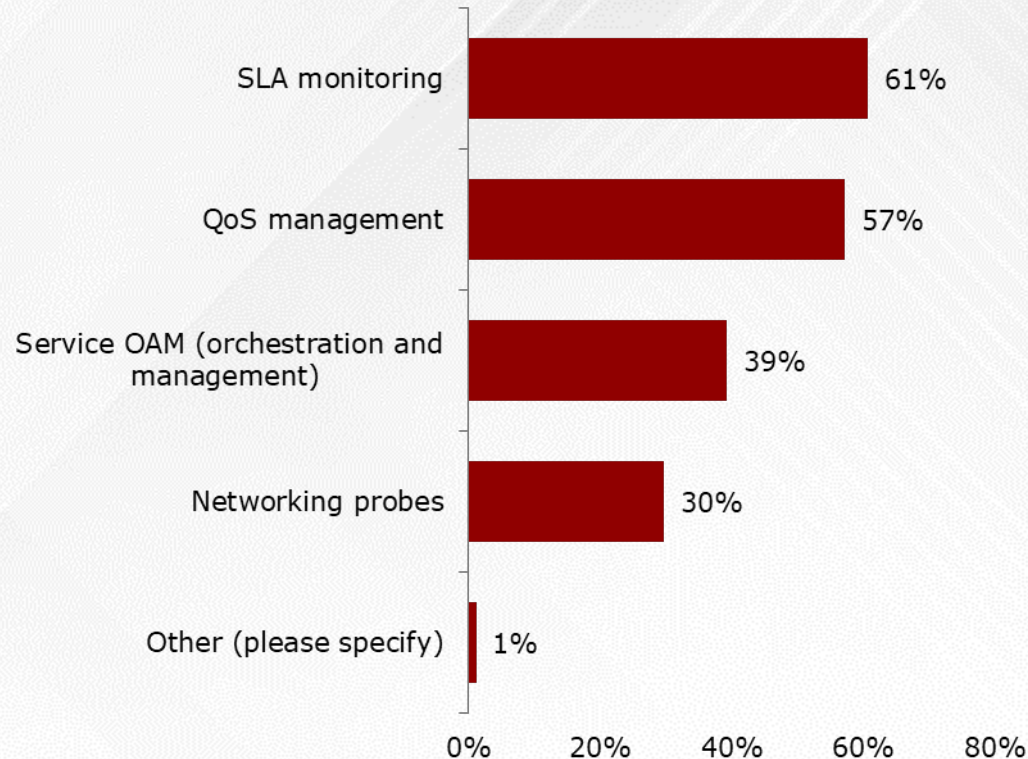


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Source: Heavy Reading

- Within built-in security, distributed denial of service (DDoS) and network device integrity stand out as most important
  - DDoS selected by 60%
  - Zero trust selected by 56%
- Secure zero-touch provisioning (ZTP) and IPsec are also important for many
- Comparing 2023 results to 2022:
  - The addition of zero trust to available options in 2023 was a good decision, as it is statistically as important as DDoS for chief security officers (CSOs)

# Important service assurance attributes

## Which integrated service assurance attributes are most important?



- Within service assurance, service-level agreement (SLA) monitoring and quality of service (QoS) management are the most important capabilities
  - SLA monitoring selected by 61%
  - QoS management selected by 57%
- Comparing 2023 results to 2022:
  - Very consistent survey results between the two years

n=84  
Source: Heavy Reading

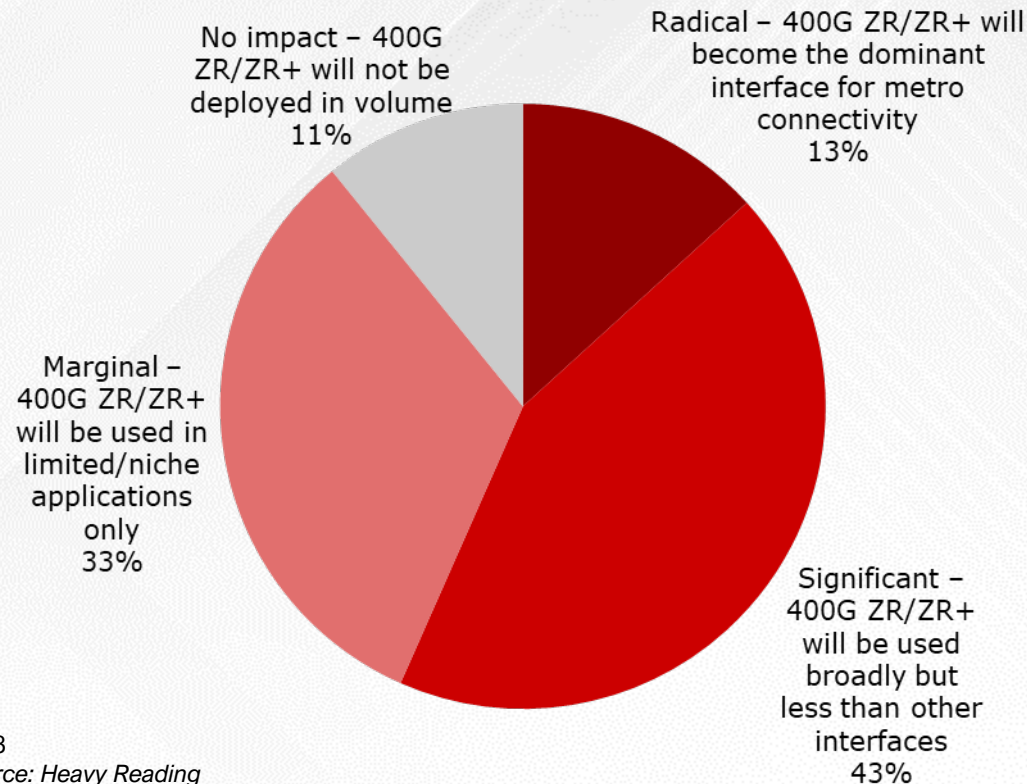


# Coherent pluggable optics



# Expected impact from 400G ZR/ZR+ coherent pluggables

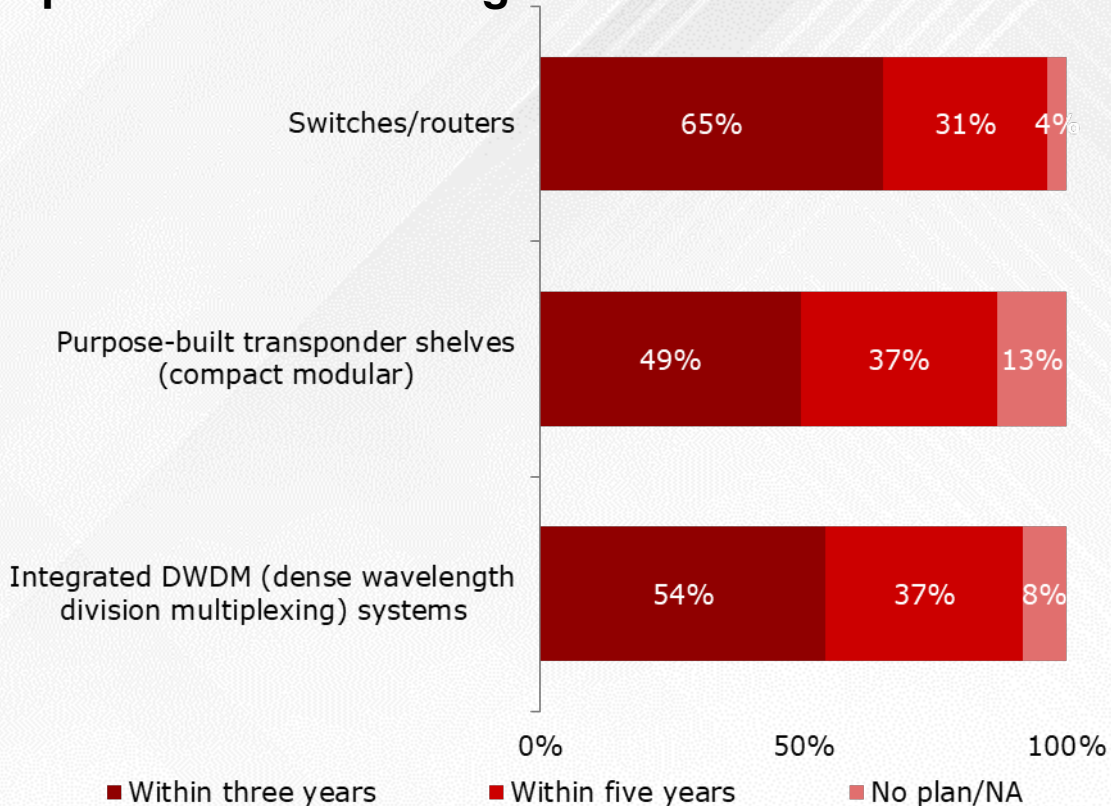
## How much impact do you expect 400G ZR/ZR+ coherent pluggables to have on your metro network in the next three years?



- A majority of CSPs expect 400G ZR/ZR+ pluggables to play a major role in metros over the next three years
  - 56% report that 400G ZR/ZR+ will be at least “significant” in their networks
- However, few believe that 400G ZR/ZR+ will become the dominant interface
  - Just 13% expect a “radical” role for 400G ZR/ZR+
- Comparing 2023 results to 2022:
  - Results are similar to the 2022 survey, though with sentiment somewhat less bullish
    - “Significant” share dropped to 43% from 53%
    - “Marginal” share increased to 33% from 22%
  - Awareness of challenges and complexities may be tempering some early enthusiasm

# Coherent pluggables deployment options

## When will you deploy coherent pluggable optics to the following network elements?

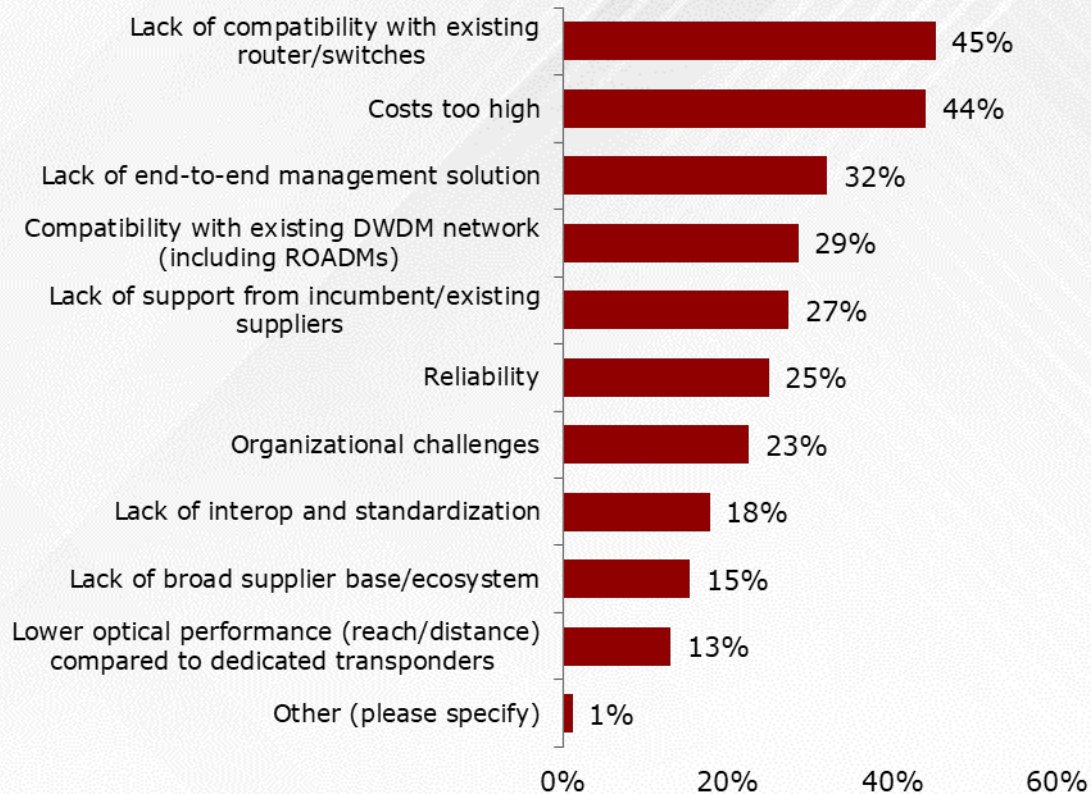


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Source: Heavy Reading

- Results point to a broad mix of deployment options for coherent pluggables
  - 65% expect coherent pluggables will be housed in switches/routers within three years
  - 54% will deploy in DWDM systems
  - 49% will deploy in compact modular systems
- Comparing 2023 results to 2022:
  - The trend line and priority order remain the same in 2023 as in 2022
  - The expectation for IPoDWDM has ticked down slightly
    - 65% expecting DWDM in the 2023 survey vs. 72% in the 2022 survey
    - Consistent with a slight softening of early optimism for the technology

# Barriers to coherent pluggables

## What are the biggest barriers to coherent pluggable optics in metro networks?



n=84  
Source: Heavy Reading

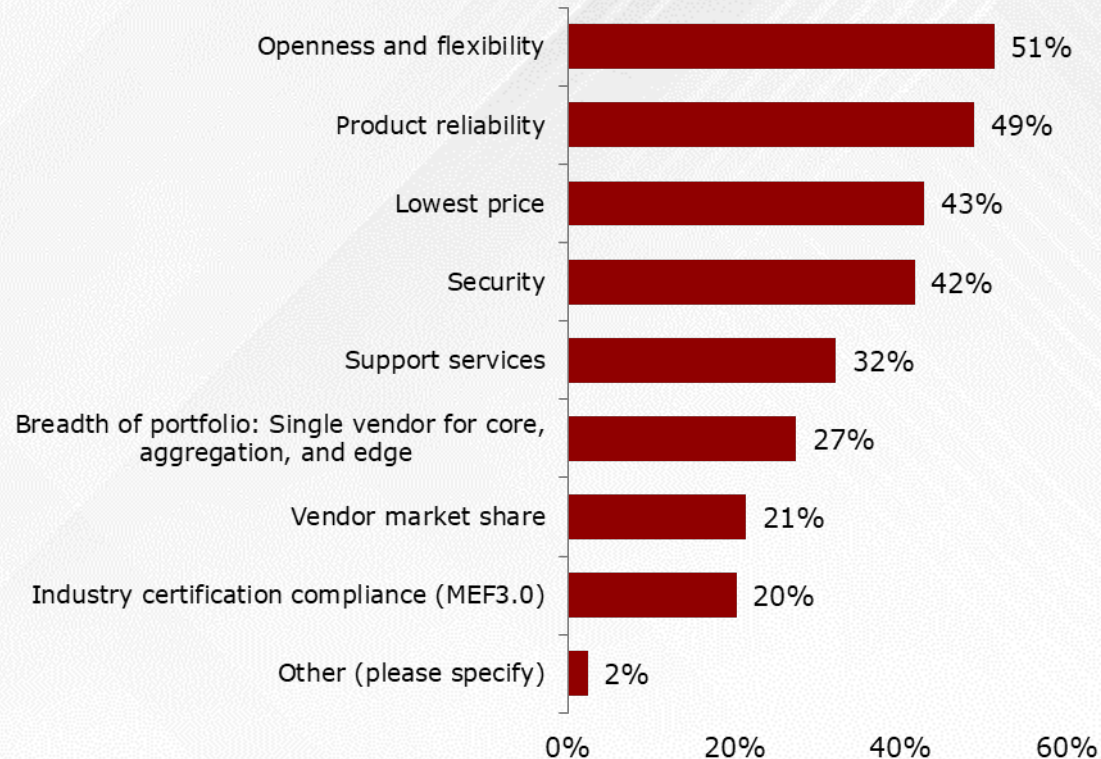
- Lack of compatibility with existing routers/switches (selected by 45%) and high costs (selected by 44%) stand as the top two barriers to coherent pluggable optics
  - Lack of router compatibility has risen as a concern over the past years, particularly from a management perspective
- Five other barriers were selected by 20%+ of the survey group; these form a clear second tier compared to the top two barriers
- Lower optical performance, somewhat surprisingly, is of least concern
- Comparing 2023 results to 2022:
  - The top two concerns remain the same in 2023, but the compatibility challenge rose sharply
    - 45% in 2023 vs. 33% in 2022



# Metro vendor views

# Important networking vendor attributes

## What are the most critical attributes when evaluating metro network solution vendors?

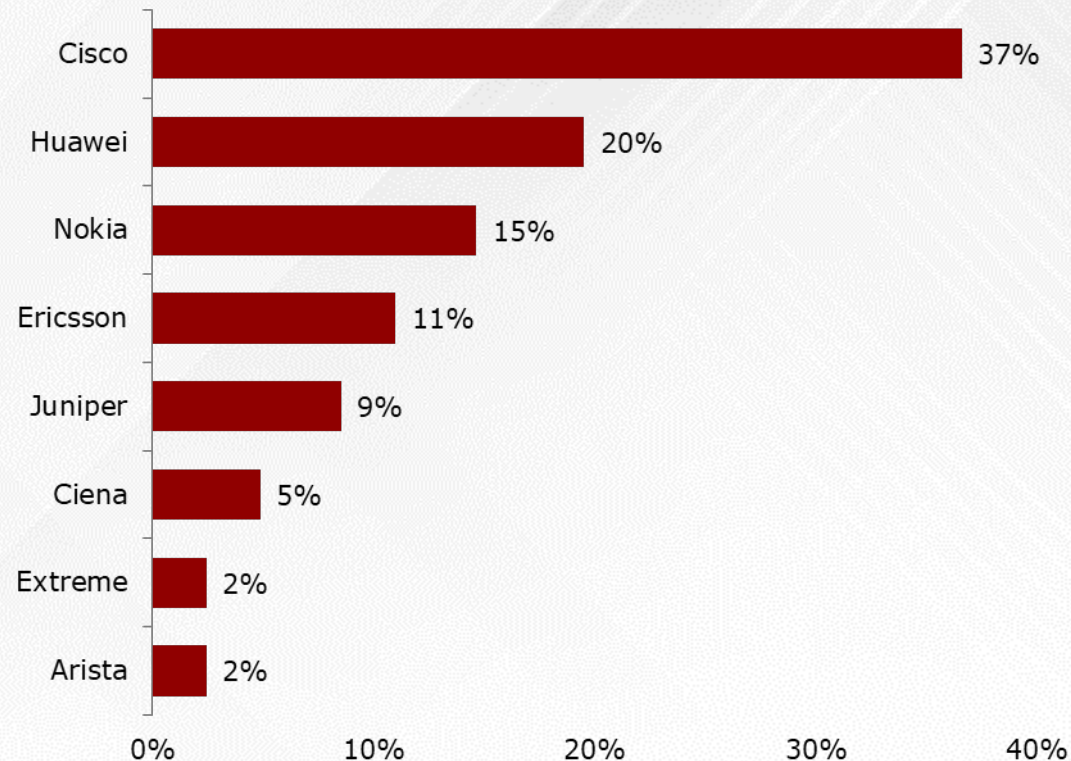


n=84  
Source: Heavy Reading

- Openness/flexibility and product reliability are the top two critical vendor attributes
  - Openness/flexibility was selected by 51%
  - Product reliability was selected by 49%
- Lowest price (43%) and security (42%) also rank as highly important attributes when evaluating vendors
- Single vendor and vendor market share attributes rank near the bottom of the list
  - Best-of-breed wins out over end-to-end
- Comparing 2023 results to 2022:
  - Openness rose to the top in 2023, while security dropped
  - Lowest price also rose in the ranks in 2023

# Current primary metro networking vendor

## Which is your current primary vendor for metro networking?

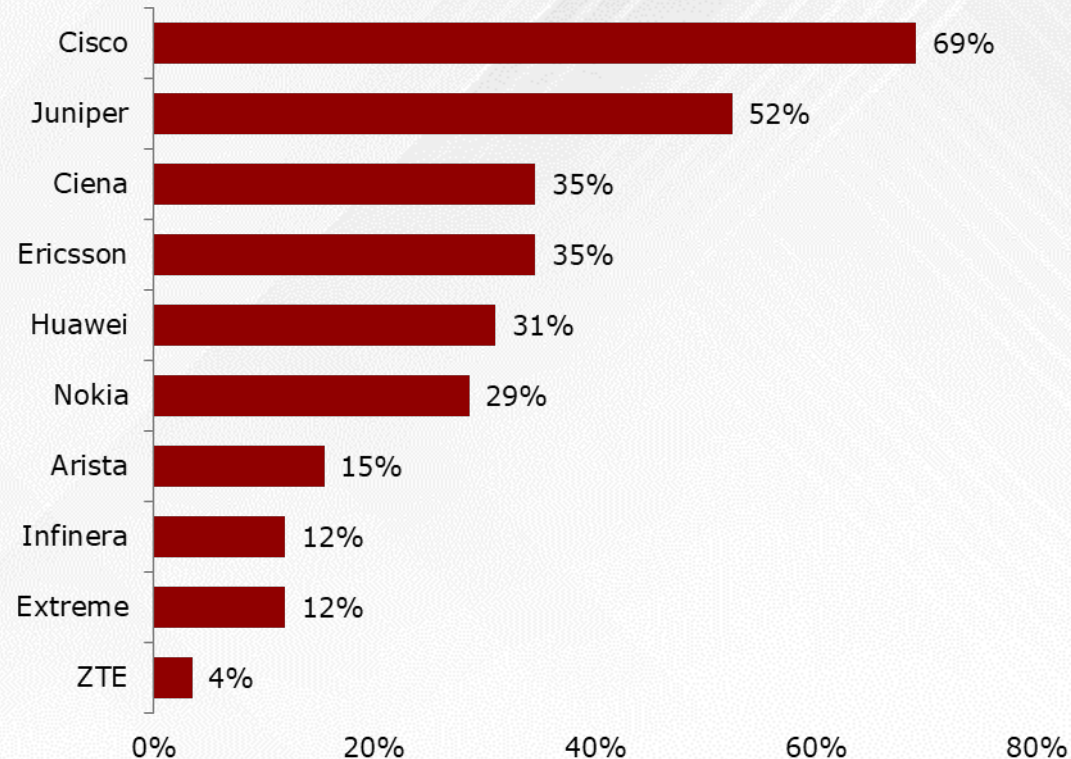


n=82  
Source: Heavy Reading

- Among respondents, Cisco has a commanding lead as the primary metro supplier
- Selected by 20%, Huawei ranks a distant second
  - Note: Just 13% of respondents are from Asia Pacific
- Juniper ranks fifth on the list at 9%
- Comparing 2023 results to 2022:
  - Cisco and Huawei are the top two primary suppliers in both years
  - Ciena experienced a bit of decline, dropping to 5% in 2023 from 12% in 2022
  - Juniper occupies a similar position in both surveys
    - Primary for 9% in 2023 vs. 12% in 2022
  - Note that the respondent mix is not the same for each year, so results cannot be mapped to actual changes in global market share

# Perceived leaders in metro networking

## Which vendors do you perceive as the leading vendors for metro networking?



n=84

Source: Heavy Reading

- Cisco is the primary vendor for a plurality of CSPs and is also the perceived leader for the majority (selected by 69% of CSPs)
- However, for the most part, perceived leaders don't map to the primary vendors
  - Selected by 52%, Juniper ranks second behind Cisco and well ahead of the rest of the vendors
- This finding indicates a significant opportunity for Juniper to gain share
- Comparing 2023 results to 2022:
  - The stark mismatch between Juniper's primary status and its leadership perception was first identified in 2022
  - Cisco and Juniper have moved further ahead of the pack in the 2023 results



# Conclusions



## Conclusions (1/4)

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### Metro network modernization

- For the majority of CSPs surveyed, metro modernization has begun.
  - 68% report metro modernization is a work in progress.
  - For 30%, projects are planned but have not yet begun.
- At 51%, meeting traffic growth requirements is the top driver for metro network modernization.
  - Increasing network reliability/resilience (42%) and lowering TCO (40%) are also highly important drivers for modernization.
  - Sustainability is a buzzword in 2023, yet it registered surprisingly low as a primary driver.
- 5G (ranked first) and edge/cloud (ranked second) continue to be the top two business drivers for metro network modernization.
  - Both rank well ahead of the other drivers provided.

## Conclusions (2/4)

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### Automation

- Three drivers rise to the top for implementing automation in metro networks:
  - Reducing time to deploy network and services (43%)
  - Lowering network TCO (39%)
  - Improving overall customer experience (36%)
- Although it is commonly discussed, using automation to address labor shortages ranked last on the list of automation drivers in the survey (selected by just 15%).
- Complexity stands out as the primary automation challenge. Lack of automation technology maturity and high costs to implement are also major hurdles.
- At 44%, a plurality identified service provisioning and activation as the top automation use case.
  - Network root-cause analysis/troubleshooting and network inventory/resource management are also highly important for CSPs.

## Conclusions (3/4)

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### Coherent optics

- A majority of CSPs expect 400G ZR/ZR+ pluggables to play a major role in metros over the next three years.
  - 56% report that 400G ZR/ZR+ will be at least “significant” in their networks.
  - Comparing 2023 results to 2022, there is a slight softening of enthusiasm, perhaps due to a greater awareness of challenges.
- Results point to a broad mix of deployment options for coherent pluggables, but IPoDWDM (aka coherent routing) garnered the strongest interest.
  - 65% of CSPs surveyed expect coherent pluggables will be housed in switches/routers within three years.

## Conclusions (4/4)

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### Vendors & functions

- A lot of capabilities are very important for a lot of CSPs.
  - Network security tops the list of most important capabilities (selected by 64%).
  - Network slicing (57%), high speed interfaces (56%), next-gen protocols (52%), service assurance (50%), and automation (48%) are all highly important.
  - In a separate question, built-in security ranks the highest among a list of seven options to rate, selected as “critical” by 43% of CSPs.
- While Juniper was selected as the primary vendor by only 9% of CSPs, the company was selected by 52% of respondents as a perceived leader in metro networking.
  - In perceived leadership, Juniper is second only to Cisco and well ahead of the rest of the vendors.
  - This same Juniper trend was identified in the 2022 study and represents a large untapped opportunity to gain market share in metro networking.



[www.heavyreading.com](http://www.heavyreading.com)

[perrin@heavyreading.com](mailto:perrin@heavyreading.com)

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