

A man in profile, wearing glasses and a dark jacket, is looking at a smartphone. The background consists of horizontal light streaks in shades of blue, green, and yellow, creating a sense of motion and technology.

2020 Global Networking
Trends Report

Trends in network talent

New skill sets for the modern network



Section summary



Key takeaways

- New technologies are eliminating many manual tasks in many industries, and IT is no exception.
- The good news for IT and networking is that job demand remains strong for those who acquire new in-demand skill sets such as network programmability.
- As network operations become more automated, network administrators will take on roles that align to new operational practices related to management of network lifecycle, policy, and assurance.
- Network strategists will take on high-value roles that target improving business alignment, integrating IT processes, improving security, and making better use of data.



Key findings

- On average, network maintenance tasks take up 55% of a network team's time and resources today.

- 27% of IT leaders identified the lack of necessary skills as a main obstacle to transitioning to an advanced network.
- 22% of IT leaders prefer reskilling by investing in training, continuing education, and certifications.
- Network strategists identify AI, IT/OT integration, automation, and network DevOps as top areas for skills enhancements.



Essential guidance

Strategists: Consider acquiring technical, business, and software expertise that allows you to develop along one or more of the following tracks:

- The business translator will focus on aligning IT performance to dynamic business intent.
- The network guardian will focus on bridging network and security architectures.
- The network data architect will focus on leveraging network analytics and AI.
- The network integration architect will focus on integration across network and IT domains.

Section summary (continued)



Practitioners: Proactively acquire the right mix of technical and software skills that allow you to develop in one or more of the following emerging areas:

- The network commander will focus on network lifecycle management.
- The network orchestrator will focus on policy translation and automation.
- The network detective will focus on service assurance and network security.

Leaders: Consider these recommendations to build the network team of the future:

- Cultivate a culture of continuous learning.
- Find the balance between reskilling and hiring.
- Invest more in training and development.
- Rotate talent to increase business acumen.
- Foster an inclusive work environment.



Top prediction

“By 2025, 75% of networking teams will spend less than a third of their time maintaining the network status quo and two-thirds delivering innovation and creating value for the business.”

– Joe Clarke, distinguished engineer, Cisco

New skill sets for the modern network

Over the next two years, advanced networking technologies will alter nearly every network role. With IT assuming a more central role in business transformation, IT professionals must adapt.

60% of business leaders believe IT is leading the organization’s business transformation strategy. Yet 93% of executives say the skills gap is preventing them from transforming fast enough.³⁴

Whether a line of business is deploying a new IoT application, new cloud service, or new compliance policy, IT professionals need to understand what is required from the network and what their role will be so they can deliver the required network services on time and securely.

In this part of the report, we’ll examine how three key IT roles—network strategist, network practitioner, and IT leader—are changing and identify the new skill sets these professionals will need in order to oversee a rapidly evolving enterprise networking environment.



IT leader

- Overall IT and network oversight
- Oversee network strategy and budget

Titles: CIO, VP IT infrastructure, director of IT

Network strategist

- Responsible for defining network strategy, roadmap, architecture, and technology preferences

Titles: Network strategist, IT/network architect, network manager

Network practitioner

- Responsible for deploying, configuring, maintaining, and troubleshooting the network

Titles: Network engineer, network administrator, network support engineer

Preparing for changing networking skill sets

It should come as no surprise that as the enterprise network evolves, so do the skills that are needed to build and manage it. In two recent

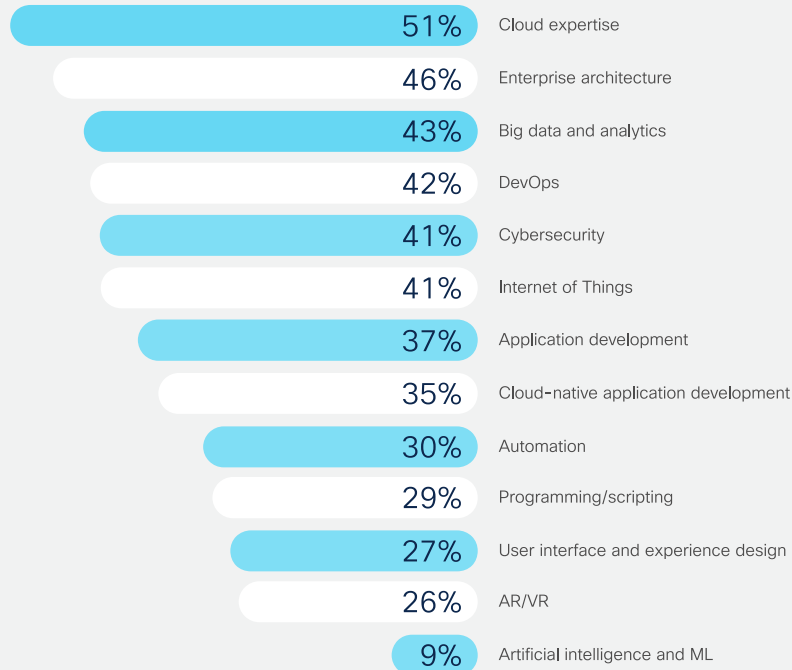


surveys, IT leaders and network strategists reveal the skills gaps they are seeing in the usual and not-so-usual places.

The biggest information technology skills gaps

Data from our IT talent survey reveals that across IT in general, advanced technologies such as cloud expertise, enterprise architecture, big data and analytics, DevOps, and cybersecurity top the list of technical skills and expertise in need.³⁴ Incidentally, the need for expertise in the first four skills gaps topics—cloud, enterprise architecture, data analytics, and DevOps—offers strong evidence of IT’s changing roles.

Figure 30 Top IT skills gaps



Question: What are the most important technology skills or expertise that your IT department needs to support business transformation?

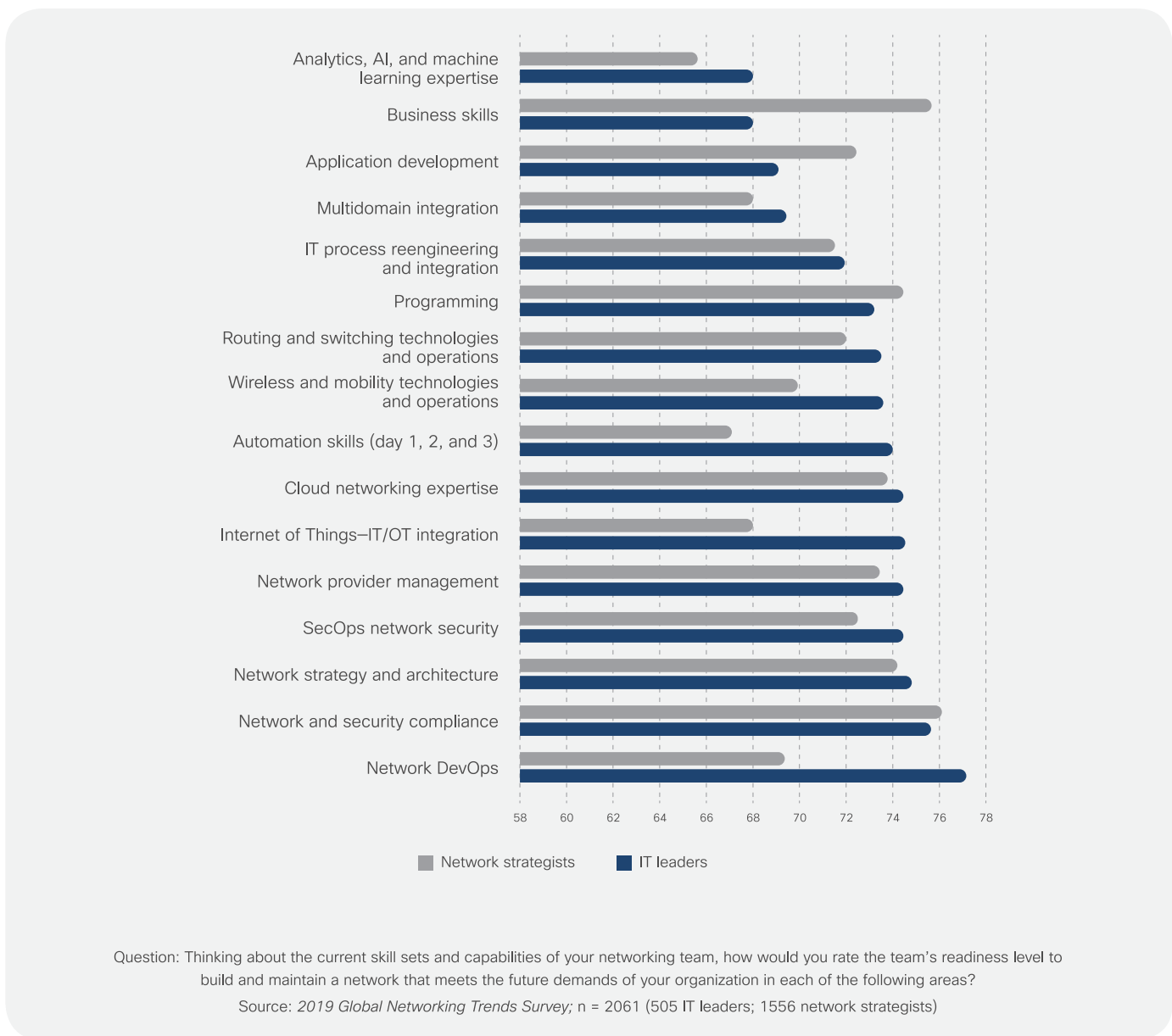
Source: *Next-Generation IT Talent Strategies*, Cisco, October 2018; n = 600 IT and business executives

The biggest networking skills gaps

In our *2019 Global Networking Trends Survey*, we asked IT leaders and network strategists to rate their team’s readiness in building and maintaining a network that meets the future demands of their organization.

Overall, leaders and strategists express a fair level of confidence in their network team’s capabilities. IT leaders identified analytics and AI, together with business skills and application development skills, as needing the most attention. While network strategists also recognized analytics and AI as a gap, they identified IT/OT integration, automation, and network DevOps as the other key areas for improvement.¹⁴

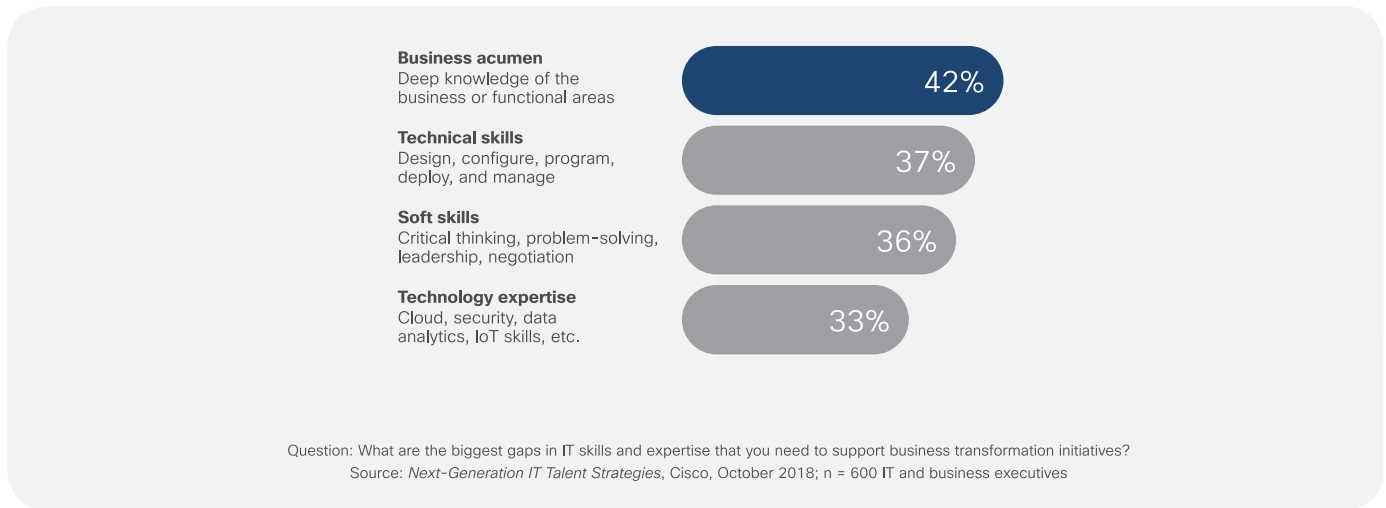
Figure 31 Confidence in networking team readiness across different skill sets



Increasing need for business and soft skills

Our own IT talent survey reveals that a lack of business acumen is the number-one skills gap in IT today.³⁴ Filling this gap will be critical as organizations transition to intent-based networks. By speaking the language of the business, IT can effectively translate business objectives, or intent, into high-level IT policies, which in turn can determine infrastructure and device configurations.

Figure 32 Business acumen identified as a top skills gap



How Cisco does it: Developing business acumen

At Cisco, we've created "Customer Zero," a program that places IT professionals in product development, where they can develop business acumen and soft skills like critical thinking and deep problem-solving. This encourages employees to adapt and transform in ways that help us stay competitive.

Network administrators, for example, who add programming or data analytics capabilities to their skill set can fill an emerging role in a way that effectively broadens their contribution and increases the value of their work.

These crossover roles will require unique and much-sought-after combinations of discrete technical areas and language-based skills.

Crossover roles more prominent in the future

In the near future, some IT roles will evolve into crossover positions that span more than one area.

For example, practitioners might program the network via APIs and programming languages. Or NetOps and SecOps teams might collaborate to build streamlined operational workflows between the two teams.

“We need network and infrastructure engineers who are driven to design, build, and operate critical network infrastructure who are innovative and can run operations that are complex tasks. The most effective organizations will have teams of domain experts in both software and infrastructure who can work together effectively.”³⁷

– Susie Wee, SVP and CTO, Cisco DevNet



with designing network-enabled business innovations like location-based personalization, workplace utilization optimization, or remote expert applications.

New roles for network strategists

Undoubtedly, the most pressing job for network strategists will be to build an effective, low-risk roadmap to a more agile and business-aligned network architecture. Strategists will also need to optimize IT by creating self-service network catalogs, integrating the network into IT processes, integrating NetOps and SecOps workflows, and converging IT and operational technology (OT). Organizations will need help

Strategist of the future: Delivering value beyond the network

Cisco distinguished engineer Joe Clarke believes that the network strategist role will increasingly encompass functions that are currently off the radar of most strategists today. Network strategists will likely evolve along one or more of the following tracks:

The **business translator** focused on aligning IT performance with business intent:

The translator will work to better turn the needs of the business into service-level requirements that can be applied and monitored across the network. The translator will also work to better use the network and network data for business value and innovation.

Business skills: Ascertain business requirements and translate them into network requirements.

DevOps skills: Understand how network platform APIs and natural language processing (NLP) technologies can bridge business intent and IT.

The **network integration architect** focused on integration of network and IT domains:

Integrators will work to integrate the network into the IT process and with external systems. The integrator will also be responsible for the integration between network domains to ensure that intent is delivered across all relevant domains.

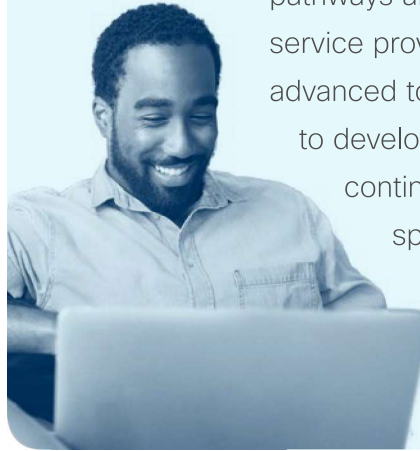
IT process reengineering and integration: Understand IT processes and workflows to change and integrate network operations for improved efficiencies.

ITSM service operations: Understand information technology infrastructure library (ITIL) processes to effectively link network assurance systems to ITSM capabilities.

DevOps skills: Develop an understanding of the APIs offered by an open-network platform and how they can enable integrated workflows with other IT systems.

The **network guardian** focused on bridging network and security architectures:

Guardians will build the distributed intelligence of the network into the security architecture



How Cisco does it: Continuous IT learning pathways

At Cisco, we have developed several IT learning pathways around enterprise, security, data center, service provider, collaboration, DevNet, and other advanced topics, giving engineers the opportunity to develop cutting-edge skills. We also offer continuing education for all associate, specialist, professional, and expert levels, as well as free or discounted training and certifications for employees.

and SecOps processes. The network guardian will have a critical role in the convergence of networking and security.

Security skills: Define network security architectures, deploy network security technologies, and understand the role the network has in contributing to overall security.

DevOps skills: Understand how network platform APIs can enable integration with SecOps systems.

The **network data architect** focused on leveraging network analytics and AI:

The network data architect will work to better leverage the vast amounts of data traversing the network and emerging AI-enabled tools to improve IT services and inform the business.

Analytics and AI skills: Harvest data to make better decisions faster. Understand AI

technologies and how they can be applied for network assurance and integrated with other IT systems for overall service assurance.

Business insight skills: Understand the business and how it can use network-accessible data to inform decisions and create new opportunities.

New roles for network practitioners

As digital transformation becomes central to an organization’s strategy, network practitioners will need to focus less on repetitious management tasks and more on value-added services that support business goals. This will become easier to do as increasing levels of automation in advanced networks begin eliminating the IT engineers’ more time-consuming tasks.



Network engineers of the future: Delivering value beyond connectivity

As intent-based networks become more prevalent, network practitioners’ roles will evolve to support one or more network operations

“A successful network engineer today is one who is good at integrating new technologies with traditional ones, and who bridges the gap between networking and software development. This calls for both a DevOps mind-set and a better understanding of how technology is linked to business goals.”

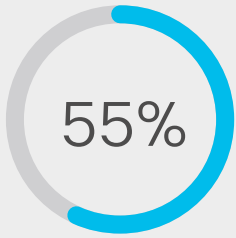
– Joe Clarke, distinguished engineer, Cisco

pillars: lifecycle, process, or assurance. In this scenario, network practitioners will need to develop skills to carry out one or more of these potential roles:

The **network commander** focused on network lifecycle management:

The commander will take charge of the processes and practices that ensure the overall health and continuous operation of the network controller and underlying network.

Required skills: Operate, maintain, and tune a controller that delivers automation and orchestration in intent-based networking environments. Ensure the sustainability of platform integrations with



Repetitious management tasks can take up 55% of network practitioners' time and resources today.¹⁴

other systems. Understand the lifecycle of these controllers and ensure the continuous health, security, compliance, and stability of the controllers and the underlying network.

The **network orchestrator** focused on policy translation and automation:

Orchestrators need to understand how business needs translate into network policy and then manage the automation of those policies. Orchestrators will also be responsible for policy alignment with other network and IT domains.

Required skills: Master how to employ infrastructure automation tools, automation protocols, and data models. Gain proficiency with Linux, Python, and network programmability developer tools. Understand common data formats. Become familiar with agile software development methodologies and be comfortable using APIs and toolkits to interface with network controllers and devices.

The **network detective** focused on network and service assurance:

Detectives will be adept at using and tuning network assurance tools that use advanced analytics and AI to ensure that the network

delivers on the promised business intent. Detectives will need to integrate with IT service management processes, and they will also work closely with the SecOps team to ensure that network anomalies are flagged and potential security holes are closed.

Required skills: Identify and prioritize trends based on AI-driven insights so the organization can proactively take action. Tune and provide feedback to the analytics systems so that anomaly detection and remediation is continuously improving. Integrate network problem detection and resolution processes into IT and security processes.

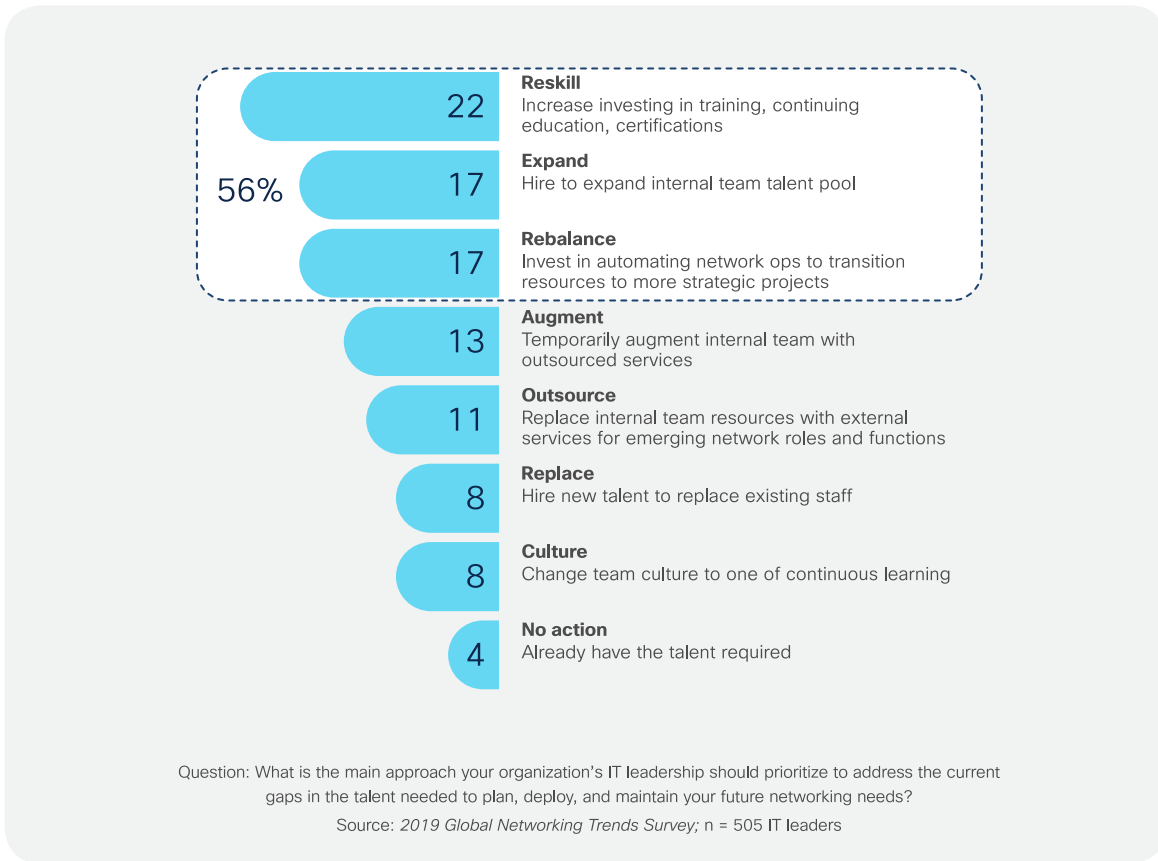


IT leaders: Taking action to fill the networking talent gap

Building technical skills now is critical for delivering successful digital transformation in the future. In our *2019 Global Networking Trends Survey*, we invited IT leaders to share what they are currently doing to develop their talent. Reskilling, expanding, and rebalancing are the top approaches.

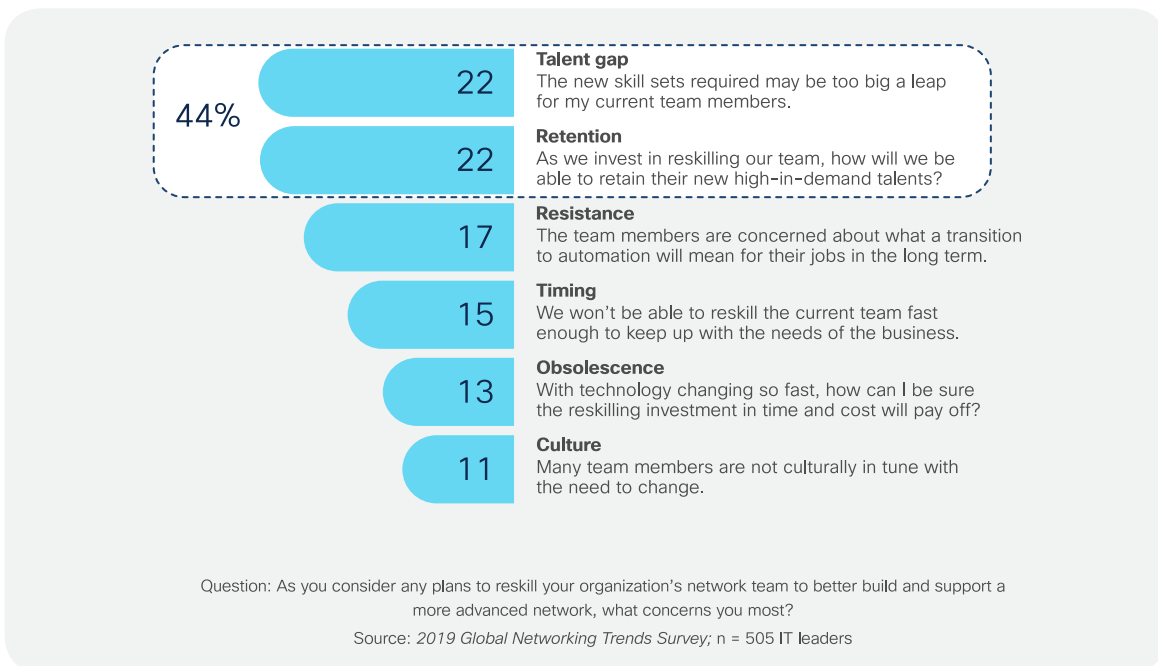


Figure 33 Preferred approaches to addressing networking skills gaps



While leaders have concerns about reskilling, it continues to be the preferred approach for both IT business skills and IT technical skills.

Figure 34 Biggest concerns with reskilling





Recommendations for IT leaders: How to build the network team of the future

According to Guillermo Diaz, SVP of customer transformation at Cisco, these five strategies can help leaders build a networking team equipped to power a digitally transformed business.

- 1 Cultivate a culture of continuous learning:** It is absolutely essential that IT leaders cultivate a culture of continuous learning. Doing so will help network practitioners and strategists regularly master the skills they need to adapt to new technologies and operational processes. This can be done through a combination of in-house and outside development opportunities that give your teams a variety of education, experience, and exposure.
- 2 Find the balance between reskilling and hiring:** Our research shows that leaders are increasingly relying on reskilling to fill skills gaps. When it comes to new technologies, however, the opposite seems to be the case. Many organizations are looking for new talent to fill emerging tech jobs, especially around AI and ML. Finding the right balance between development and hiring will depend on business and operation goals and where you are in your network transformation.

“Reskilling is less costly than turning to the outside market to hire a new specialist, certainly in terms of salary and recruitment fee, but also in terms of the cost of onboarding, transferring organizational tacit knowledge, and process familiarity. Your existing people may lack certain new skills and capabilities, but they likely have a lot of what you need to give you a head start.”³⁸

– Colin Seward; CIO in Europe, the Middle East, Africa, and Russia; Cisco

- 3 Invest more in training and development:** In a recent survey of IT leaders, we discovered that organizations that are more successful in their digital transformation spend almost 10% more on training and development for their IT staff.³⁴ When IT is able to match the pace of technology change, it is able to make faster, smarter, and better data-driven decisions in support of business objectives.

Meeting new needs: Cisco’s expanded certification suite

To help address these new training requirements, network curriculums and certifications, such as those delivered by Cisco, are being rapidly refreshed.³⁷

	Associate Level	Specialist Level	Professional Level	Expert Level
Engineering				
Software				

4 Rotate talent to increase business acumen:

Having IT and business staff exchange places through short-term rotations expands understanding, develops broader context, and enables more productive interactions afterward. More specifically, the ability to provide networking, application, and business rotations provides a blend of technology, programmability, and business acumen skills.

5 Foster an inclusive work environment:

The previous recommendations center on talent. Creating a workplace that is highly inclusive means making the most of the talent your organization has at its disposal. Companies that prioritize diversity and inclusion in how they recruit, manage, develop, and reward employees are shown to outperform rivals that do not. It starts with executive leadership and a commitment to behavioral standards, programs, policies, and training that create the conditions

for an inclusive organizational environment. The next-generation IT organization has to “walk the talk” of a diverse, inclusive culture in how it operates every day.

How Cisco does it: Attracting new talent

Finding good talent doesn’t happen by accident. That’s why we use programs like our IT University, Cisco Networking Academy, and the Cisco International Internship Program to identify and hire new talent, as well as the Cisco Veterans Program, which helps us train and employ veterans interested in technology careers.

About this report

The *2020 Global Networking Trends Report* gives IT leaders, strategists, and practitioners insights into current and future networking trends across the enterprise and offers essential guidance on networking technology, operations, and talent. The report is based on original Cisco research and includes new data from the *2019 Global Networking Trends Survey* of 2061 IT leaders and strategists from 13 countries. In addition, Cisco leaders, fellows, and distinguished engineers provide expert analysis and recommendations for organizations transitioning to advanced networking technologies.



This report is dedicated to Cliff Apsey, whose passion for delivering the best digital experiences for customers inspired us to make this report a better experience for you. We appreciate the time we had with Cliff and will forever miss him.

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