IT Networking Career Pathways

Jobs in network support, service, administration, and design

WHAT IS NETWORKING?

An IT network includes a system of hardware, software, and devices that connect multiple computers, peripherals, servers, and related equipment to allow for exchanging data. A network connection relies on either wireless (e.g., Wi-Fi) or wired (e.g., cable) technology. Workers in this field build, use, and maintain IT networks.

AREAS IN NETWORKING

Network jobs in New York City's public sector span a variety of job duties and skill sets. Roles in user and network support provide general or network-focused advice and help to end-users and tend to have the lowest barrier to entry. Network administration and design includes more senior-level positions in the field, consisting of professionals developing, managing, and maintaining networks. The area of data center and mainframe computer operation also provides the opportunity for beginners to become experts in network support and administration. Network professionals who would like to apply their skills in a related IT career may find opportunities in IT security and project management. With the right combination of education and experience, IT professionals can advance to managerial roles.

WORK ENVIRONMENT

Most IT network professionals work full-time, and they may need to be available during evenings, weekends, and holidays. Long hours are more common in the private sector where salaries also tend to be higher. Except for data center operators and user and network support workers who travel to job sites to respond to service requests, other IT network professionals can perform tasks in offices. The COVID pandemic has accelerated the trend toward telecommuting, which can add flexibility in work schedules.

EMPLOYMENT OUTLOOK

With more people working from home and relying on the internet for activities such as shopping and entertainment because of the pandemic, network professionals are in constant demand by employers across sectors. All jobs in this career map have "favorable" or "very favorable" employment growth prospects from 2018 through 2028 according to the New York State Department of Labor.

IT NETWORKING JOBS & POSSIBLE ENTRY POINTS

■ DATACENTER AND MAINFRAME COMPUTER OPERATIONS

IT workers who manage the operation and maintenance of big computer systems such as mainframe computers and data centers monitor and improve system performance, troubleshoot hardware and software issues, and keep maintenance logs to ensure they function smoothly. As mainframe computers are increasingly replaced with servers, databases, and other platforms, job duties have grown broader and can include providing user support, network support and administration, and database management for these specialized systems. Computer aides can advance to become computer associates or computer specialists in operations, or even become experts in a specialized area such as network or database administration.

Critical skills: interpersonal, detail-oriented, analytic, problem-solving, and teamwork skills; computer proficiency

■ USER AND NETWORK SUPPORT

IT workers who maintain and troubleshoot personal computers and their network connections can enter the field as computer service technicians or telecommunication associates. The former are help-desk technicians who install, support, and repair computer hardware, software, and networking for end-users. The latter install and manage upkeep of telecommunications systems, including phones, cables, routers, and voice and data communication circuits. Experienced workers can move into the supervisory roles of supervising computer service technician or telecommunication manager, respectively, or even become an IT service management specialist who plans, coordinates, and manages all IT service activities for the release or upgrade of major IT solutions. Alternatively, as workers accumulate fundamental IT knowledge from these two entry-level positions, including networking support, they can move into a more focused IT role such as network administration.

Critical skills: verbal communication, interpersonal, detail-oriented, analytic, and problem-solving skills; knowledge of IT components, computer systems, and networks; supervisors need to plan, coordinate, and manage personnel, resources, and activities

■ NETWORKING ADMINISTRATION & DESIGN

Certified IT administrators (LAN/WAN) design, implement, operate, maintain, troubleshoot, and manage the security of networks, including local area networks (LANs), wide area networks (WANs), and/or metropolitan area networks (MANs). At least one certification in a related area is required.* They can advance to senior positions that provide high-level solutions. Senior IT architects and IT infrastructure engineers design, build, implement, manage, and optimize IT infrastructure, a foundational platform that provides structure and support for IT hardware, software,

networks, and facilities. IT automation and monitoring engineers use software to automatically configure, provide, manage, and test network devices and services to replace or reduce manual operation. Network administrators, engineers, and architects work together to ensure the networks comply with infrastructural standards or provide automation support.

Critical skills: interpersonal, detail-oriented, analytic, creative problem-solving, leadership, and management skills; knowledge of networking design & administration, infrastructure design, artificial intelligence, and machine learning

■ RELATED OPPORTUNITIES IN IT

Experience in network administration and design can lead to a career focused on IT security. Many network administration tasks involve protecting networks from unauthorized access, misuse, or theft. Network administrators with a special focus on network security can advance to become an IT security specialist who designs, implements, maintains, and provides training on security practices to secure organizations' computer systems, networks, applications, and data.

Workers with a background in network administration and design can also become a project manager. Any type of network project requires project management skills to streamline workflows and ensure successful completion within the established scope, budget, and timeline. Project management duties fall under the title of IT project specialist, which can also include subject matter experts from any IT domain.

Critical skills: interpersonal, detail-oriented, leadership, collaboration, time management, multitasking, analytic, and problem-solving skills; knowledge of IT security, project and risk management

■ MANAGERIAL

Computer operations managers plan, organize, and oversee the operation and maintenance activities of computer hardware, software, equipment, and related facilities for IT units within or across city agencies. They are usually promoted from computer specialist (operations). All computer systems managers have administrative responsibilities, but other duties associated with the role vary depending on the requirements of the specific position. They can work as technical leads that develop and manage complex IT projects, managers that oversee an agency's IT department and supervise IT functions, or both. With leadership qualities, managerial skills, and experience, several mid-level positions, including certified IT administrators (LAN/WAN), can advance to this title.

Critical skills: communication, leadership, business, organizational, decision making, multitasking, analytic, and problem-solving skills; project and budget management; expertise in certain IT domain(s)

* Check NYC's Local 2627 and Department of Citywide Administrative Services websites for the list of acceptable certifications.
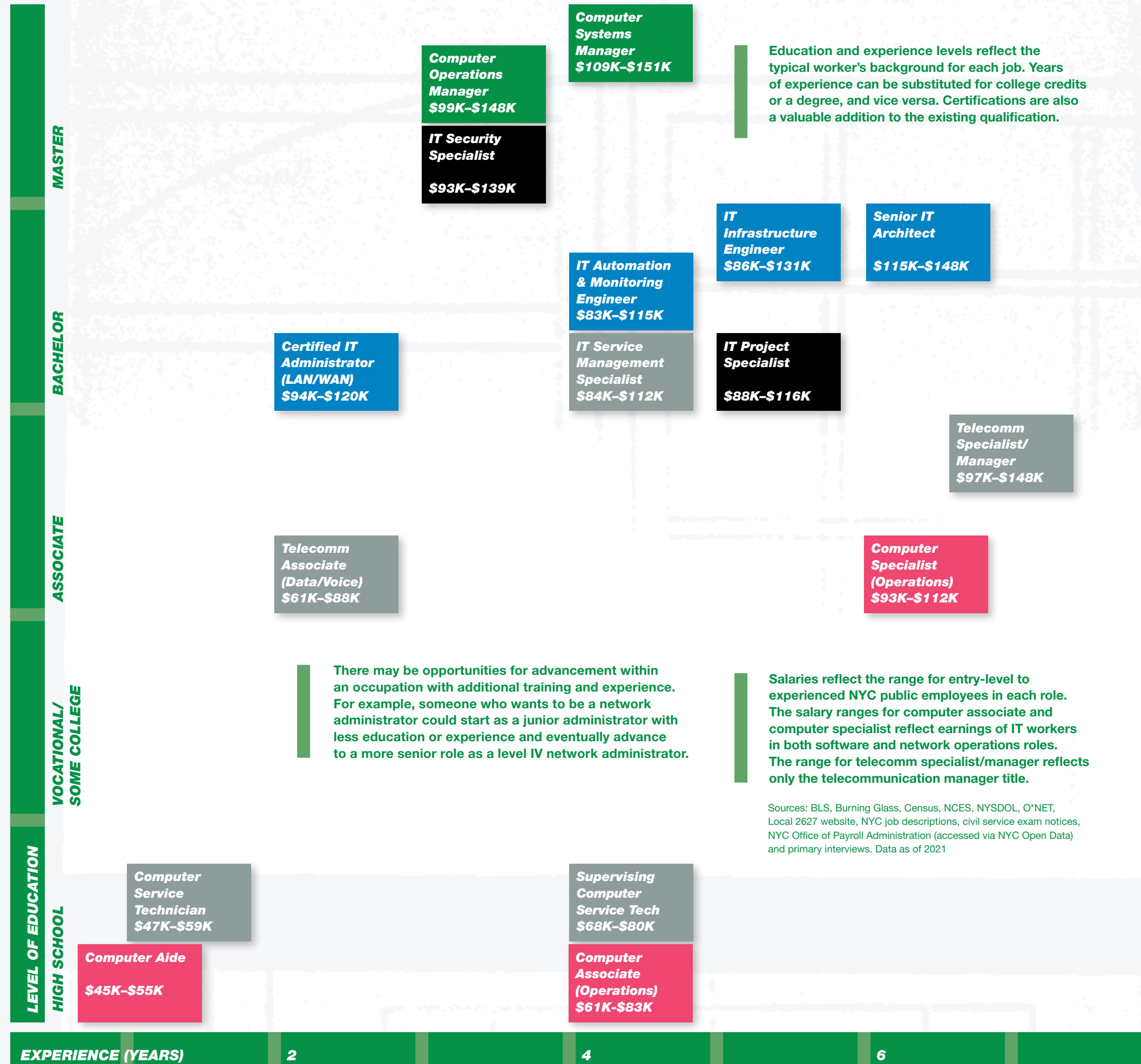
Education and experience levels reflect the typical worker's background for each job. Years of experience can be substituted for college credits or a degree, and vice versa. Certifications are also a valuable addition to the existing qualification.

There may be opportunities for advancement within an occupation with additional training and experience. For example, someone who wants to be a network administrator could start as a junior administrator with less education or experience and eventually advance to a more senior role as a level IV network administrator.

Salaries reflect the range for entry-level to experienced NYC public employees in each role. The salary ranges for computer associate and computer specialist reflect earnings of IT workers in both software and network operations roles. The range for telecomm specialist/manager reflects only the telecommunication manager title.

LEVEL OF EDUCATION

MASTER
- Computer Systems Manager $109K–$151K
- Computer Operations Manager $99K–$148K
- IT Security Specialist $93K–$139K

BACHELOR
- IT Infrastructure Engineer $86K–$131K
- Senior IT Architect $115K–$148K
- IT Automation & Monitoring Engineer $83K–$115K
- Certified IT Administrator (LAN/WAN) $94K–$120K
- IT Service Management Specialist $84K–$112K
- IT Project Specialist $88K–$116K

ASSOCIATE
- Telecomm Specialist/Manager $97K–$148K
- Telecomm Associate (Data/Voice) $61K–$88K
- Computer Specialist (Operations) $93K–$112K

VOCATIONAL/SOME COLLEGE

HIGH SCHOOL
- Computer Service Technician $47K–$59K
- Supervising Computer Service Tech $68K–$80K
- Computer Aide $45K–$55K
- Computer Associate (Operations) $61K–$83K

EXPERIENCE (YEARS)
2   4   6

IT NETWORKING PROGRAMS IN PUBLIC INSTITUTIONS

COLLEGE NAME	PROGRAM NAME	Certificate/Training	Associate Degree	Bachelor's Degree	Advanced Certificate	Master's Degree	Doctoral Degree
NYC							
CUNY BOROUGH OF MANHATTAN CC	Cyber-Security Micro-credential	●					
	CS/CIS/Computer Network Technology		●				
CUNY BRONX CC	CS/CIS/Cybersecurity and Networking		●				
CUNY CITY COLLEGE	CS/Computer Engineering			●		●	
	Cybersecurity					●	
CUNY CITY TECH	CS			●			
	CIS/Computer Engineering Technology		●	●			
CUNY COLLEGE OF STATEN ISLAND	CS			●		●	
	IS and Informatics			●			
CUNY GRADUATE CENTER	CS						●
CUNY KINGSBOROUGH CC	CIS/CS		●				
CUNY LAGUARDIA CC	CS/Computer Technology		●				
CUNY LEHMAN COLLEGE	CS			●		●	
	CIS			●			
CUNY QUEENS COLLEGE	CS			●		●	
	CIS	●	●				
HUDSON VALLEY							
ROCKLAND CC	CIS/Computer Support Specialist/Cybersecurity						
SUNY NEW PALTZ	Computer Engineering						
	CS						
SUNY WESTCHESTER CC	Cybersecurity						
	CS/Networking						
LONG ISLAND							
NASSAU CC	CS/Computer Repair Technology						
	IT						
	Cisco Certified Entry Network Tech/Cybersecurity						
STONY BROOK UNIVERSITY	Computer Engineering/CS						
	IS						
SUNY OLD WESTBURY	Computer & Information Science/MIS						
NEW JERSEY							
BERGEN CC	CS & IT/Cybersecurity/Networking Admin						
	Computer Technical Support/Network Security						
HUDSON COUNTY CC	CS/Computer Technology						
KEAN UNIVERSITY	CS/IT						
	CIS						
	Computational Science & Engineering						
MIDDLESEX COUNTY COLLEGE	BIS/CIS/CS/Network Administration and Support						
	Network Admin						
NEW JERSEY CITY UNIVERSITY	CS						
NEW JERSEY INSTITUTE OF TECHNOLOGY	IS						
	CS						
	IT Admin/Cybersecurity and Privacy						
	Foundations of Cybersecurity & Privacy/Information Security/Network Security and Information Assurance						
UNION COUNTY COLLEGE	CS/CIS & Technology						
COLORADO STATE UNIVERSITY-GLOBAL CAMPUS	IT						
	Cybersecurity						
	Networking/IT Operations						
PENNSYLVANIA STATE UNIVERSITY-WORLD CAMPUS	IS and Technology						
	Cybersecurity Analytics and Operations						
	Enterprise Info and Security Technology Architecture						
UNIVERSITY OF ARKANSAS EVERSITY	IT						
UNIVERSITY OF FLORIDA-ONLINE	CS						
UNIVERSITY OF WISCONSIN-MILWAUKEE FLEX	Information Science and Technology						