

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY

Name and address of submitting body:

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Name and contact details of individual dealing with the submission

Name:	PawanVerma
Position in the organisation	Technical Officer
Address if different from above	NA
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List of documents submitted in support of the Qualifications File

- 1. Detailed Curriculum**
- 2. Industry Validation (Attached at Annexure I)**
- 3. Placement Records(Attached at Annexure II)**

QUALIFICATION FILE SUMMARY

Qualification Title	Advance Diploma in Hardware ,Networking and Information Security
Qualification Code	NIELIT/IS/1/15
Body/bodies which will assess candidates	Examination Cell, National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi. 110003.
Body/bodies, which will award the certificate for the qualification.	Certification Division, National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan,Lodhi Road, New Delhi. 110003.
Body, which will accredit providers to offer the qualification.	Accreditation Division, National Institute of Electronics and Information Technology, 6-CGO Complex, Electronics Niketan, Lodhi Road, New Delhi. 110003.
Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> • System Administrator • Network Administrator • Systems support • Technical support • Server Administrator
Proposed level of the qualification in the NSQF.	5
Notional Learning Hours	1220 hours.
Entry requirements / recommendations.	10+2, 10+ITI / Graduate
Progression from the qualification.	Network Administrator –IT Manager- IT Project Manager Initially, candidate can work as Network Administrator/System Administrator, who would be to capable of implementing, administering, maintaining LAN /WAN Networks and overall Security Systems. The candidate would be in position to plan , design and implement the LAN as well as Windows /Linux Network services in any organisation .
Planned arrangements for RPL.	<ul style="list-style-type: none"> • Presently only candidates who undergo training shall be assessed. • It will be incorporated once RPL strategy is finalized

Formal structure of the qualification

	Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
ADHNS I	PC & PERIPHERAL ARCHITECTURE (ADHNS I)	Mandatory	120	5
ADHNS II	OPERATING SYSTEM & DIAGNOSTIC UTILITIES (ADHNS II)	Mandatory	120	
ADHNS III	BASIC NETWORK (ADHNS III)	Mandatory	120	
ADHNS IV	NETWORKING THROUGH WINDOWS-2012 (ADHNS IV)	Mandatory	120	
ADHNS V	PROGRAMMING TOOLS AND TECHNIQUES (ADHNS V)	Mandatory	120	
ADHNS VI	NETWORKING THROUGH LINUX (ADHNS VI)	Mandatory	120	
ADHNS VII	CLOUD COMPUTING (ADHNS VII)	Mandatory	120	
ADHNS VIII	ADVANCE NETWORKING (ADHNS VIII)	Mandatory	120	
ADHNS IX	WIRELESS NETWORK (ADHNS IX)	Mandatory	120	
ADHNS X	INFORMATION SECURITY (ADHNS X)	Mandatory	120	
ADHNS XI	ENHANCING COMMUNICATION & SOFT SKILL (ADHNS XI)	Mandatory	20	

Please attach any document giving further detail about the structure of the qualification – e.g. a Curriculum or Qualification Pack. Detailed Curriculum attached at Annexure III.

SECTION 1 **ASSESSMENT**

Name of assessment body:

Examination Cell

National Institute of Electronics and Information Technology
6-CGO Complex, Electronics Niketan,
Lodhi Road, New Delhi. 110003.

Will the assessment body be responsible for RPL assessment?

Give details of how RPL assessment for the qualification will be carried out and quality assured.

Presently, only candidates undergoing training shall be assessed. Later on, candidates having experience and knowledge shall be assessed. The information will be provided on finalization of such procedure.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on practical demonstration of skills & knowledge based on the performance criteria. Each OUTCOME is assessed & marked separately. Student is required to pass in all OUTCOMES individually and marks are allotted. Following assessment methodologies are used.

- A. Written Assessment (Multiple Choice Questions)
- B. Practical Assessment
- C. Viva Voce Assessment

Supporting evidences for Assessment

The assessment results are backed by following evidences.

- 1 The assessor collects a copy of the attendance for the training done under the scheme. The attendance sheets are signed and stamped by the In charge / Head of the Training Centre.
- 2 The assessor verifies the authenticity of the candidate by checking the photo ID card issued by the institute as well as any one Photo ID card issued by the Central/Government. The same is mentioned in the attendance sheet.
- 3 The assessor assigns roll number.
- 4 The assessor takes photograph of all the students along with the assessor standing in the middle and with the centre name/banner at the back as evidence.

Please attach any documents giving further information about assessment and/or RPL.

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

Job Role

- System Administrator
- Network Administrator
- Systems support
- Technical support
- Server Administrator

Title of Unit/Component:

(Detailed Curriculum attached As Annexure-III)

Assessable Outcomes	Assessment criteria for the outcome	Total Mark	Written	Practical	Vivo-voce
1. To Familiarize With PC & Peripheral Architecture	Learn fundamental of Computer, Basic Electronics and Components	200	35	20	8
	Identify components like Diodes and Transistors, Measuring Instruments		30	25	6
	Follow different concepts of Digital and Integrated Circuits, Power Supplies and practical implementation		20	20	6
	Architecture of PC Peripherals		15	10	5
		Total	100	75	25
2. Understand Basic Concept of Operating System & Diagnostic Utilities	Follow Concepts of BIOS, POST & DOS Batch Files, Discovering Windows 7/ 8	200	50	40	15
	Maintain Backup Procedure & Disaster Prevention		25	15	5
	Apply General Troubleshooting And		25	20	5

	Maintenance				
		Total	100	75	25
3. Develop Concept of Basic Network	Identify components of Networks, Media and Connectors, Networking Devices	200	30	25	9
	Concept of Network Model		60	40	13
	Use of Internet and its Service Providers		10	10	3
		Total	100	75	25
4. Explain Concepts of Networking Through Windows 2012	Concepts of Windows 2012 Serve , Managing File System and Security Resources, Accessing Files and Folders: Managing file and folder attributes	200	30	25	6
	Creating Users and Groups, Configuring network services and access, Configure VPN and routing, Web Server Management with IIS		33	20	4
	Install and Manage Active Directory, Configure domain account policies, Configure and manage Group Policy, Auditing and Security, Deploy, manage, and maintain servers		27	30	11
		Total	100	75	25
5. Demonstrate Knowledge of Programming Tools And Techniques	Learn Basics of C Language and HTML	200	50	35	13
	Learn JAVA Programming and PHP Programming and practical implementation of it.		50	40	12
		Total	100	75	25
6. Developing Concept of Networking Through Linux	Follow Concept of CentOS Linux , Installing CentOS Server, Using the Command Line, System Administration	200	25	25	10
	System Management, Configuring Server for Security, Configuring a Network Connection and Introduction to Cryptography, Creating CentOS Server as a File Server,		45	25	10
	Setting of Web server, Squid Proxy, Server and securing Web Services, Setting Up the Firewall with ip tables, Setting Up the Mail Server		30	25	5
		Total	100	75	25
7. Develop Concept of Cloud Computing	Follow Concept of Cloud Computing, Virtualization, Building Cloud Networks and practical implementation	200	75	50	15

	Identify Private , Public & Hybrid Clouds and Setting up your own Cloud		25	25	10
		Total	100	75	25
8. Develop Advance Concept of Networking	Explain Internetworking Basics, IP Sub netting and (VLSM), Understand Router User Interface and Command-Line Interface, Routing Basics and Switching Basics	200	50	40	10
	Learn Concept of VLAN , Components of a Router, Managing Traffic with Access Control Lists, Understand Network Address Translation and WAN Protocols		50	35	15
		Total	100	75	25
9. Explain Concepts of Wireless Network	Follow Concepts of Wireless Network, Characteristics of Wireless Medium, Understand Physical Layer Alternatives for Wireless Networks,	200	40	25	10
	Follow Network Planning, Acquire Knowledge of Wireless LAN, GSM, TDMA Technology and CDMA Technology,		40	35	10
	Use Mobile Data Networks, Bluetooth Technology, Overview of Wireless Broadband Networking		20	15	5
		Total	100	75	25
10. Learn and practice Information Security	Operate and test Information Security, Cryptography, Intruders, Virus and Firewalls, Protocols weaknesses in TCP/IP and other protocols	200	40	30	10
	Manage Ethical Hacking, Scanning and Enumeration, Trojans, Backdoors, Viruses, and Worms		30	20	5
	Execute Sniffing, Web Application Vulnerabilities, OS Hardening Understand Network infrastructure security		30	25	10
		Total	100	75	25
11. Enhancing Communication & Soft Skill	Develop Communication Skill	50	10	N/A	N/A
	Managing career, staff and professional relationships		20	N/A	N/A
	Ready for interview		20	N/A	N/A
		Total	50	N/A	N/A
	Grand Total	2050	1050	750	250

Means of assessment 1

Proctored online assessments (LAN and Web based), carried out using a variety of question formats applicable for linear / adaptive methodologies; performance criteria being assessed via situation judgement tests, simulations, code writing, psychometrics and multiple choice questions etc.

SECTION 2 EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Incremental human resource requirement (2013-17, 2017-22) and skill gaps
Current workforce of nearly 4.3 million in 2013 is expected to reach 8.9 million by 2022

Electronics & It Hardware is one of the emerging sectors for employment growth in India. Industry currently employs over 4.3 million people across manufacturing, Sales and marketing (including Retail) and Repair & Maintenance segments.

Policy initiatives on promoting manufacturing along with increasing disposable income would drive the growth for the sector. Industry is expected to witness an addition of 4.61 million during 2013-22. Repair and Maintenance segment would contribute to maximum growth of employment

Segment	Employment (in Million)			Employment Growth 2013-17	Employment Growth 2017-22	Employment Growth 2013-22
	2013	2017	2022	(In millions)	(In millions)	(In millions)
Design & Manufacturing	1.45	1.75	2.06	0.30	0.31	0.61
Sales & Marketing	1.58	2.33	3.34	0.75	1.01	1.76
Repair, installation and Maintenance	1.30	2.16	3.54	0.86	1.38	2.24
Total	4.33	6.24	8.94	1.91	2.70	4.61

Subsector

Computers and peripherals

Adoption of new technologies driving demand

- New technologies such as cloud computing and mobility are transforming the IT hardware sector. Companies require professionals skilled in cloud management, remote infrastructure management and mobile computing devices
- The trend towards wearable computing devices is likely to increase in the next decade, which would lead to significant demand for skilled employees
- There is growing demand for professionals skilled in analytics and statistics in this sub sector besides those skilled in sales and services of related products

Changing skill
Requirements

- New technologies emerging, such as cloud computing and mobile applications leading to shift in the manpower needs of electronics and networking sector as new roles are being created
- The demand for software roles earlier has now shifted toward mobile applications.
- The demand for hardware technicians has been replaced with the demand for networking engineers

(Source: Reports on *Human Resource and Skill Requirements in the Electronics and IT Hardware Industry (2013-17,2017-22)* Volume -9 by NDSC <http://www.nsdcindia.org/sites/default/files/files/Electronics-IT-hardware.pdf>)

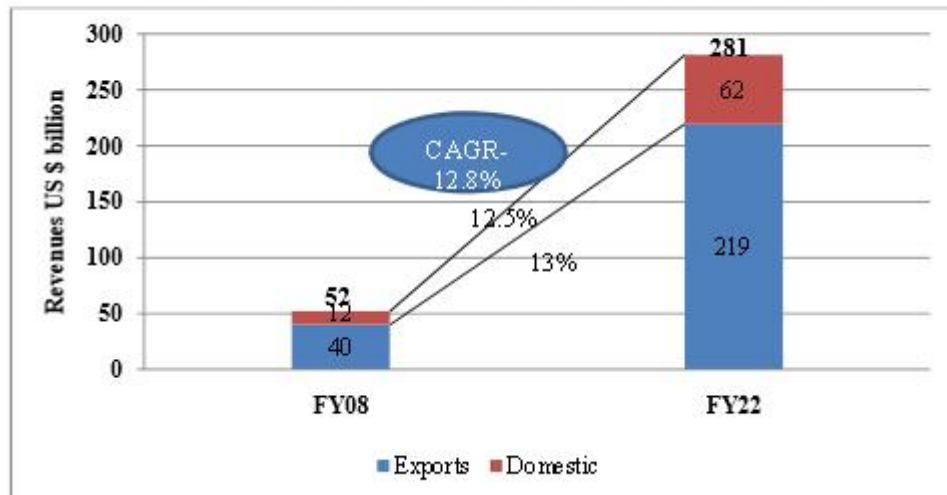
5. Projected Industry Size and Human Resource Requirement

5.1. Outlook for the IT and ITES Industry

As outlined in the earlier sections, sustained technology spending globally, and increasing GDP growth and spending in India are expected to be primary drivers of growth. Post 2020, growth drivers in addition to traditional IT and BPO services large companies (in the Fortune 500) in US and EU will arise from Small and Medium Businesses (SMBs), public sector, healthcare, media, and utilities. A significant portion of the growth would be driven by markets in BRIC countries, APAC, Japan, and Rest of the world. A shift would occur in terms of customer expectations, led by innovation, end-to-end offerings, risk management, and compliance. It is expected that the 'outsourcable' market would expand from the current US \$ 500 billion to about US \$ 1.5 to 1.6 trillion by 2020. Sustained GDP growth, increasing public sector spends, and adoption of IT by industry would drive the domestic component of the market.

Given these factors, it is expected that the Indian IT and ITES Industry would record about US \$ 220 billion in exports and US \$ 60 billion domestically by 2022, totalling to about US \$ 260 billion growing at a CAGR of 12.8%.

Figure 13: Forecasted size of Indian IT and ITES Industry by 2022



5.2. Projected Human Resource Requirements

Based on the trends witnessed in productivity and the likely growth potential of the IT and ITES industry, it is expected that the industry would employ about 7.5 million persons directly by 2022. A large portion of this employment is expected to occur in the ITES (BPO/KPO) exports sector, followed by IT exports and then in the domestic market.

The projected human resource requirement for the various growth scenarios mentioned earlier are detailed below.

Table 11: Projected human resource requirement in the IT and ITES sector (in million)

Human Resource Employment Scenarios (million persons employed)		FY08	FY22	Incremental
Pessimistic	Exports	1.7	4.9	3.2
	IT Exports	0.9	2.0	1.1
	ITES Exports	0.8	2.9	2.2
	Domestic	0.5	1.1	0.6
	Total	2.2	6.1	3.8
Likely	Exports	1.7	6.0	4.2
	IT Exports	0.9	2.4	1.5
	ITES Exports	0.8	3.6	2.8
	Domestic	0.5	1.5	1.0
	Total	2.2	7.5	5.3
Optimistic	Exports	1.7	8.6	6.9
	IT Exports	0.9	3.5	2.5
	ITES Exports	0.8	5.1	4.3
	Domestic	0.5	2.1	1.6
	Total	2.2	10.7	8.5

(Source: Human Resource and Skill Requirements in the IT and ITES Sector (2022) –A Reports by NSDC
<http://www.nsdciindia.org/sites/default/files/files/IT-ITES-Industry-2009.pdf>)

NASSCOM SETS-UP CYBER SECURITY TASK FORCE TO BUILD INDIA AS THE CYBER SECURITY HUB

Task force in accordance with the Prime Minister’s vision for India to take leadership in this critical and emerging space

Focus on building key recommendations on the four pillars of Industry + Policy + Technology + Skills

National Association of Software and Services Companies (NASSCOM) and Data Security Council of India today announced the launch of the NASSCOM Cyber Security Task Force that

aims to build India as a global hub for providing cyber security solutions, developing cyber security R&D plan and develop a skilled workforce of cyber security experts.

The taskforce members include industry leaders across IT, BPM and Internet, leaders from user organizations like banks and telcos as well as representatives from the government and academia. Mr Rajendra Pawar, Chairman, NIIT was requested to chair this taskforce. The taskforce over a 12 week period will identify the key priorities and build the detailed action plan for the sector.

Key Statistics

- IT Security market estimated at USD77 billion in 2015 and growing at over 8 percent annually
- Demand for security workforce to rise globally to 6 million by 2019, up from 4 million currently, with projected shortfall of 1.5 million.
- Security market in India estimated to be 1% of the overall IT-BPM industry.
- Rapid growth in security software product segment – USD 250 million revenues in FY 2015

Mr. Rajendra Pawar, Chair, NASSCOM Cyber Security Task Force and Chairman, NIIT, said, “Securing the cyberspace has become an important priority for governments, businesses and citizens across the world. In line with the Prime Minister’s vision of making India a cyber-security expert nation and his recent exhortation to the industry, we have created the cyber security task force. This taskforce aims to make India a global hub for providing cyber security solutions including cyber security products and services. The taskforce will focus on the four key pillars of Industry development, Policy enablement, Technology development and Skill development.”

Mr Mohan Reddy, Chairman, NASSCOM said “Cyber Security is an important priority for NASSCOM.”

This Task Force will study the Indian cyber security ecosystem to identify issues and challenges and develop an action plan to address the priority issues. It will also identify possible intervention opportunities for the Indian IT industry in global cyber security space and bring together stakeholders from across the board to develop cutting-edge technologies and address the global market requirements. Learnings from global countries will be undertaken to understand how to catalyse the security product ecosystem in India.

Mr. R. Chandrashekhar, President, NASSCOM, said, “Cybersecurity is a multi-dimensional concept which includes many disciplines and fields. Nations have to take appropriate steps in their respective jurisdictions to create necessary laws, promote the implementation of requisite security practices, incident management, and information sharing mechanisms, and continuously educate both corporate and home users about cybersecurity. It is a global problem that has to be addressed by all stakeholders jointly. This Task Force will work towards enhancing cyber security and enabling India to emerge as a leader in this space.”

Mr Gopal Pillai, former Home Secretary and Chairman, DSCI said “Cyber Security has emerged as a key facet of national security. This initiative by NASSCOM and DSCI is an important effort aimed at optimizing the role of industry in this space, both at the national and international levels.”

The vision of the Taskforce aims to build the cyber security industry in India from the 1 percent market share to 10 percent by 2025; a trained base of 1 million certified and skilled cyber security

professionals and build 100+ successful security product companies from India.

(Source: <http://www.nasscom.in/nasscom-setsup-cyber-security-task-force-build-india-cyber-security-hub>)

What is the estimated uptake of this qualification and what is the basis of this estimate?

20 students / Batch – 2 Batches /Year

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

As the understanding and adoption models of QPs evolve in the industry and across its sub-sectors, we foresee consolidation of qualification packs as a natural progression. The Qualification does not exist as per information available in public domain.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

The Qualification is to be monitored and reviewed every two years.

The following data will be used

1. Results of assessments
2. Employer feedback will be sought post-placement
3. Student feedbacks
4. Workshops and seminar for reviewing the qualifications
5. Industry Requirements
6. Consultation/ Tie-up with Industries or Expert for review of the Curriculum.

Please attach any documents giving further information about any of the topics above.

NIL

SECTION 3
SUMMARY EVIDENCE OF LEVEL

Level of qualification: 5

Summary of Direct Evidence:

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role.

Network Administrator/System Administrator					
Process required	Professional knowledge	Professional skill	Core skill	Responsibility	Level
<p>The trained candidate carries out the job by applying range of theoretical practical skills gained in the course.</p> <p>The trained candidate would carry out tests and technical procedures to resolve routine issues arise in the system, network and operating system etc.</p> <ul style="list-style-type: none"> The candidate would use TCP/IP troubleshooting utilities to resolve the day to day networking problems. 	<p>They are proficient in developing solution based on detailed design and practical knowledge gained during course.</p> <p>The trained candidate would be able to provide enterprise networking as well as server solution by utilising knowledge gained during the training i.e.</p> <ul style="list-style-type: none"> Windows Server 2012 CentOS Linux Routing & Switching Wireless Networking Information Security Planning & Implementation VPN & NAT 	<p>After acquiring professional knowledge on system administration, tools and Techniques, the candidates will be competent to identify technical requirements in terms of hardware, software and other IT related devices.</p> <p>The trained candidate would be able to perform following job function</p> <ul style="list-style-type: none"> Planning, Designing of small to large sized Local Area Network Can identify suitable hardware or software as per the requirements arising during designing, installation and implementation of Servers and Networks. 	<p>The trained candidates after acquiring skills both managerial and technical of this level are able to interact with different stakeholders involved like vendors, clients and users.</p> <p>They are able to make independent decision involved in providing solution.</p> <p>The core skill acquainted by trained candidates are</p> <ul style="list-style-type: none"> Technical Audit of Server Network Administration Hardware and Application and System Software Procurements. Interaction with ISP and Hardware/Software Vendors. 	<p>They are able to lead team as well as work in team. They will assign some task to their team members.</p> <p>While designing implementation, installation and Maintenance of the Server, Hardware and LAN/WAN, Wifi etc the trained person would lead a group of members during work executions.</p>	5
5	5	5	5	5	

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

This qualification comprises both technical and analytic skills and can be linked to any qualification higher than this one, existing or to come.

This course is already running under Information Security Education & Awareness (ISEA) Project Sponsored by Department of Electronics & IT (DeitY), Ministry Of Electronics & IT (MeitY), Government of India since 2006-07. NIELIT Gorakhpur (Earlier DOEACC Gorakhpur) is acting as Participating Institution under ISEA Project.

Please attach any documents giving further information about any of the topics above.

Sources:

<https://isea-pmu.in/>

<http://meity.gov.in>

SECTION 5

EVIDENCE OF INTERNATIONAL COMPARABILITY

List any comparisons, which have been established.

- **CompTIA A+** (The **Computing Technology Industry Association (CompTIA)**, a non-profit trade association and CompTIA A+ certification demonstrates competency as a computer technician and is a vendor neutral certification that covers numerous technologies and operating systems from such vendors as Microsoft, Apple Inc., Novell and some of the Linux distributions) **URL:** <https://certification.comptia.org/certifications/a>
- **CompTIA Network+** (The **Computing Technology Industry Association (CompTIA)**, a non-profit trade association and CompTIA Network+ is a certification that is used to measure skill as a network technician: understanding of network hardware, installation, and troubleshooting) **URL:** <https://certification.comptia.org/certifications/network>
- **CompTIA Linux+** Linux+ is a certification of knowledge of Linux operating systems, from their installation and use to the basics of applicable free software and open source licenses. The Linux+ exam is intended for information technology professionals who have between six and twelve months of practical experience using Linux. **URL:** <https://certification.comptia.org/certifications/linux>
- **CompTIA Security+** is a certification dealing with computer security topics such as cryptography and access control, as well as business-related topics such as disaster recovery and risk management. **URL:**
- **Cisco CCNACCNA** (Cisco Certified Network Associate) is an IT certification from Cisco. The certificate validates a professional's ability to understand, configure, operate, configure and troubleshoot medium-level switched and routed networks. **URL:** <http://www.cisco.com/c/en/us/training-events/training-certifications/certifications/associate/ccna-routing-switching.html>
- **Microsoft MCSE** The Microsoft Certified Solutions Expert (MCSE) is a globally recognized standard for IT professionals are professional certifications verifying demonstrated proficiency with Microsoft products **URL:** <https://www.microsoft.com/en-in/learning/mcse-certification.aspx>

- **CWNA**The CWNA certification is a foundational level wireless LAN certification that covers radio Frequency (RF) Technologies, Antenna Concepts, Wireless LAN Hardware and Software, Network Design, Installation, and Management, Wireless Standards and Troubleshooting
URL:<https://www.cwnp.com/certifications/cwna>
- **CompTIA Cloud**The **CompTIA Cloud** specialty certification that demonstrates an individual knows what cloud computing means from a business and technical perspective, as well as what is involved in moving to and governing the cloud.**URL:**<https://certification.comptia.org/certifications/cloud>
- **CompTIA Server+**is CompTIA's certification that focuses on server-specific hardware and operating systems, and certifies technical knowledge in areas such as RAID, SCSI, and multiple CPUs, as well as capabilities with server issues, including disaster recovery.**URL:**

