

# CEDIA® JOB TASK ANALYSIS (EXAM BLUEPRINT)

## ELECTRONIC SYSTEMS CERTIFIED NETWORKING SPECIALIST (ESC-N) International (English)

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This professional certification is for an individual with 3 or more years of experience in the field; designing, configuring and troubleshooting residential computer networks.

NOTE: This is the master document on which the exam is built. CEDIA resources such as classes, books, and online training are designed to support this body of knowledge. Please refer to the **ESC-N Exam Prep Resources** document to find which resources support each area of study.



CEDIA®  
CERTIFIED  
NETWORKING  
SPECIALIST

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### Domain Network Infrastructure (26%)

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Task 1: Install communications cabling in the home using industry standards and recommended practices in order to create a robust, reliable network infrastructure. (7%)

#### KNOWLEDGE OF:

1. ANSI/TIA 570-C
2. ANSI/TIA 606-B
3. Cable terminations: Fiber Optic, Cat6A, Cat5e (TIA T568-A&B), Coaxial
4. Alternate carrier technologies
5. Power over Ethernet (PoE)
6. Running and landing cabling in a residential environment

Task 2: Perform the required level of cabling test procedures in order to ensure system performance meets or exceeds design specifications and client expectations. (6%)

#### KNOWLEDGE OF:

1. Test equipment: Verification, Qualification, & Certification
2. Wire-mapping
3. Signal attenuation
4. Cross Talk: NEXT, FEXT, PSNEXT, ELFEXT, PSELFEXT, AXT
5. Skew/Propagation delay
6. Operating network/cable testing equipment
7. Interpreting the results of advanced cable testing procedures
8. Applying test results in order develop solutions for cabling issues

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Task 3: Secure the infrastructure by evaluating and fortifying all network cabling locations (patch panels, wiring drops, NID, etc.) in order to ensure client privacy and information security. (6%)

## KNOWLEDGE OF:

1. Outlets
2. Patch panels
3. NID/demarc/aux disconnect
4. Installing secure hardware at patch panel and outlet locations
5. Securing/protecting external cable runs

Task 4: Design a wired network infrastructure using appropriate communications cabling that meets the performance requirements of the client in order to ensure long term operation and reliability. (7%)

## KNOWLEDGE OF:

1. Cable performance specifications: attenuation, bandwidth, etc.
2. Power over Ethernet devices and operation (PoE)
3. Evaluating and specifying cabling based on cable performance vs. device/system requirements
4. Utilizing new/alternative tech to distribute network communications throughout an existing home, including powerline and coaxial protocols

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## Domain Network Configuration (24%)

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Task 1: Understand the OSI model, how it applies to the network, and how to use this knowledge to efficiently and effectively troubleshoot and resolve network related issues. (7%)

## KNOWLEDGE OF:

1. The seven layers of the OSI model
2. The purpose of each of the seven layers
3. Using the OSI model to understand what layer an issue falls under
4. Network troubleshooting theory and procedures

Task 2: Implement a Local Area Network using IP addressing best practices, sub-netting, and routing in order to ensure proper network functionality and long term reliability. (8%)

## KNOWLEDGE OF:

1. LANs
2. WANs
3. Subnets
4. Gateways
5. System documentation
6. MAC addresses
7. IP addressing
8. Routing: Network Address Translation (NAT)
9. DHCP configuration
10. Implementing IP addressing schemes
11. Configuration of subnets and gateways
12. Documentation of system device addresses
13. Using MAC address reservation to statically assign an address through DHCP
14. Define how data packets are transmitted between LANs and WANs

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Task 3: Implement a network that meets the performance requirements of all client devices in order to ensure proper functionality and long term reliability. (9%)

## KNOWLEDGE OF:

1. TCP
2. UDP
3. IP
4. Common internet services: SSH, FTP, HTTP, streaming media
5. Bandwidth and throughput: bits and bytes
6. Media storage and distribution
7. Defining bandwidth as it pertains to networking
8. Determining if available bandwidth meets requirements for streaming services
9. Determining if UDP or TCP is required for a given application

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## Domain **3** Wireless Networking (24%)

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Task 1: Survey and analyze the RF spectrum using available wireless networking tools in order to ensure performance and troubleshoot problems in a residential environment. (5%)

## KNOWLEDGE OF:

1. RF spectrum
2. Available RF spectrum analysis tools
3. Performing a comprehensive wireless site survey
4. Interpreting the results of an RF spectrum site survey
5. Utilizing gathered data to design, configure, or troubleshoot a residential wireless network

Task 2: Apply knowledge of existing wireless communication protocols (802.11a/b/g/n) in order to specify the proper hardware in a residential wireless networking application. (6%)

## KNOWLEDGE OF:

1. Wireless protocols: eg. WiFi – 802.11(x), ZigBee, A-wave, etc.
2. Wireless network components: router, access point, repeater, antenna
3. Installation of wireless hardware: connection, placement, and aesthetics
4. Specification of necessary hardware to meet performance and aesthetic requirements of a project

Task 3: Ensure reliability, security, and consistent performance of the wireless portion of a residential network by proper configuration of the SSID, channel, encryption standards and security settings. (7%)

## KNOWLEDGE OF:

1. Wireless SSIDs
2. Available wireless channels and selection criteria
3. Wireless encryption standards
4. Configuration of wireless networking hardware
5. Creating secure network passwords

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Task 4: Optimize the wireless network by implementing multiple access points and wireless network controllers in order to accommodate mobile devices as control interfaces and media streaming sources. (6%)

## KNOWLEDGE OF:

1. Wireless controllers
2. Devices roaming
3. Access Points
4. Bridging techniques
5. Setup of wireless network controllers
6. Specifying the correct network topology for a large scale wireless deployment
7. Configuration of multiple wireless access points within the same network

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## Domain Network Design (26%)

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Task 1: Implement network segmentation within a residential setting through the use of VLANs and QoS in order to maximize performance of multiple client devices. (7%)

## KNOWLEDGE OF:

1. Virtual Local Area Networks
2. Quality of Service: Bandwidth, ports, DSCP, Class of Service
3. VLAN Implementation: tagging, port membership, and trunking
4. Implementing QoS protocols

Task 2: Configure a home network with remote access through the use of VPN and port management in order to safeguard client information and allow interaction from external locations. (9%)

## KNOWLEDGE OF:

1. Dynamic DNS
2. Virtual Private Networks
3. Port forwarding and port translation (PAT)
4. Network security: hardware, software, wetware, and other threats
5. Remote network troubleshooting
6. Configuration of VPNs
7. Setup of dynamic DNS
8. Implementation of port forwarding and port translation
9. Providing appropriate network security through the use of hardware, software and client education
10. Utilizing available troubleshooting tools to diagnose and repair client systems remotely

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Task 3: Secure a home network using available hardware and software tools in order to protect client privacy and information from internal and external threats (10%).

## KNOWLEDGE OF:

1. Physical security: wiring locations, demarc, outlet access
2. Username/password (credentials) best practices
3. Wetware: viruses, spyware, client education
4. Segmentation: VLANs, port management
5. Firewalls
6. Remote Access security considerations
7. Configuration of firewall settings
8. Update and configuration of antivirus and security patches
9. Ensuring the use of strong passwords
10. Educating clients to be aware of security threats
11. Fortifying equipment locations and wiring drops
12. Applying VLAN and sub-netting configurations to segment the network for security concerns