CCNA Exam Topics
Introduction to Cisco Networking Technologies
(INTRO 640-821)

From the Cisco INTRO 640-821 Exam Topics

Design and Support
- Use a subset of Cisco IOS commands to analyze and report network problems
- Use embedded layer 3 through layer 7 protocols to establish, test, suspend, or disconnect connectivity to remote devices from the router console
- Determine IP addresses

Implementation and Operation
- Establish communication between a terminal device and the router IOS, and use IOS for system analysis
- Manipulate system image and device configuration files
- Perform an initial configuration on a router and save the resultant configuration file
- Use commands incorporated within IOS to analyze and report network problems
- Assign IP addresses
- Describe and install the hardware and software required to be able to communicate via a network
- Use embedded data link layer functionality to perform network neighbor discovery and analysis from the router
- Use embedded layer 3 through layer 7 protocols to establish, test, suspend or disconnect connectivity to remote devices from the router console

Technology
- Demonstrate the mathematical skills required to work seamlessly with integer decimal, binary and hexadecimal numbers and simple binary logic
- Define and describe the structure and technologies of computer networks
- Describe the hardware and software required to be able to communicate via a network
- Describe the physical, electrical and mechanical properties and standards associated with optical, wireless, and copper media used in networks
- Describe the topologies and physical issues associated with cabling common LANs
- Identify the key characteristics of common wide area networking (WAN) configurations and technologies, and differentiate between these and common LAN technologies
- Describe the purpose and fundamental operation of the internetwork operating system (IOS)
- Describe the role of a router in a WAN
- Identify the major internal and external components of a router, and describe the associated functionality
- Identify and describe the stages of the router boot-up sequence
- Describe how the configuration register and boot system commands modify the router boot-up sequence

- Describe the concepts associated with routing, and the different methods and protocols used to achieve it
- Describe how an IP address is associated with a device interface, and the association between physical and employ IP addressing techniques
- Employ IP addressing techniques
- Compare and contrast collision and broadcast domains, and describe the process of network segmentation
- Describe the principles and practice of switching in an Ethernet network
- Explain how collisions are detected and handled in an Ethernet system
- Explain the fundamental concepts associated with the Ethernet media access technique
- Describe how the protocols associated with TCP/IP allow host communication to occur
- Describe the operation of the Internet Control Message Protocol (ICMP) and identify the reasons, types and format of associated error and control messages
- Describe the principles and practice of packet switching utilizing the Internet Protocol (IP)

Design and Support
- Use a subset of Cisco IOS commands to analyze and report network problems
  - *Basic Router Operation*
  - *WAN Protocols*
  - *Network Management*
  - *Access Denied: Network Security with Cisco Routers*
  - *ISDN and DDR*

- Use embedded layer 3 through layer 7 protocols to establish, test, suspend, or disconnect connectivity to remote devices from the router console
  - *Physical Internetworking and Industry Standards for Networks*
  - *Basic Router Operation*

- Determine IP addresses
  - *Topology and IP Addressing*

Implementation and Operation
- Establish communication between a terminal device and the router IOS, and use IOS for system analysis
  - *ISDN and DDR*
  - *Basic Router Operation*

- Manipulate system image and device configuration files
  - *Basic Router Operation*
  - *Network Management*

- Perform an initial configuration on a router and save the resultant configuration file
  - *Basic Router Operation*

- Use commands incorporated within IOS to analyze and report network problems

> *Basic Router Operation*
> *Physical Internetworking and Industry Standards for Networks*

- Assign IP addresses
  > *Topology and IP Addressing*
  > *Layer 1 and Layer 2 Ethernet*

- Describe and install the hardware and software required to be able to communicate via a network
  > *Physical Internetworking and Industry Standards for Networks*
  > *Basic Router Operation*

- Use embedded data link layer functionality to perform network neighbor discovery and analysis from the router
  > *IP Routing*
  > *OSPF in Single Areas: Learning the Protocol*
  > *Basic Router Operation*

- Use embedded layer 3 through layer 7 protocols to establish, test, suspend or disconnect connectivity to remote devices from the router console
  > *Basic Router Operation*
  > *ISDN and DDR*
  > *WAN Protocols*

Technology

- Demonstrate the mathematical skills required to work seamlessly with integer decimal, binary and hexadecimal numbers and simple binary logic
  > *Topology and IP Addressing*
  > *Physical Internetworking and Industry Standards for Networks*
  > *Network Management*

- Define and describe the structure and technologies of computer networks
  > *Basic Router Operation*
  > *Physical Internetworking and Industry Standards for Networks*
  > *How to Implement Wireless Networks*

- Describe the hardware and software required to be able to communicate via a network
  > *Basic Router Operation*
  > *IP Routing*
  > *ISDN and DDR*
  > *Physical Internetworking and Industry Standards for Networks*
  > *WAN Protocols*

- Describe the physical, electrical and mechanical properties and standards associated with optical, wireless, and copper media used in networks
  > *Physical Internetworking and Industry Standards for Networks*

How to Implement Wireless Networks
Basic Router Operation
WAN Protocols

- Describe the topologies and physical issues associated with cabling common LANs
  Physical Internetworking and Industry Standards for Networks
  Layer 1 and Layer 2 Ethernet

- Identify the key characteristics of common wide area networking (WAN) configurations and technologies, and differentiate between these and common LAN technologies
  WAN Protocols
  Address Resolution Protocol (ARP)
  Physical Internetworking and Industry Standards for Networks
  OSI Reference Model
  Network Management
  Layer 2 Switching and Bridging

- Describe the purpose and fundamental operation of the internetwork operating system (IOS)
  Basic Router Operation
  WAN Protocols

- Describe the role of a router in a WAN
  Basic Router Operation
  Physical Internetworking and Industry Standards for Networks
  WAN Protocols

- Identify the major internal and external components of a router, and describe the associated functionality
  Basic Router Operation
  Physical Internetworking and Industry Standards for Networks

- Identify and describe the stages of the router boot-up sequence
  Basic Router Operation

- Describe how the configuration register and boot system commands modify the router boot-up sequence
  Basic Router Operation

- Describe the concepts associated with routing, and the different methods and protocols used to achieve it
  Basic Router Operation
  IP Routing
  Layer 1 and Layer 2 Ethernet
  OSPF in Single Areas: Learning the Protocol
  WAN Protocols

- Describe how an IP address is associated with a device interface, and the association between physical and employ IP addressing techniques
    - *Topology and IP Addressing*
    - *Layer 1 and Layer 2 Ethernet*
    - *Physical Internetworking and Industry Standards for Networks*
    - *Basic Router Operation*

- Employ IP addressing techniques
    - *Topology and IP Addressing*
    - *Layer 1 and Layer 2 Ethernet*

- Compare and contrast collision and broadcast domains, and describe the process of network segmentation
    - *LAN Switching*
    - *Layer 2 Switching – Virtual Local Area Networks (VLANs)*
    - *Layer 2 Switching and Bridging*
    - *New Age Bridging and Switching*
    - *Layer 1 and Layer 2 Ethernet*
    - *Address Resolution Protocol (ARP)*

- Describe the principles and practice of switching in an Ethernet network
    - *Layer 1 and Layer 2 Ethernet*
    - *LAN Switching*
    - *Layer 2 Switching – Virtual Local Area Networks (VLANs)*
    - *Layer 2 Switching and Bridging*
    - *Address Resolution Protocol (ARP)*
    - *Physical Internetworking and Industry Standards for Networks*
    - *New Age Bridging and Switching*
    - *Basic Router Operation*

- Explain how collisions are detected and handled in an Ethernet system
    - *Layer 1 and Layer 2 Ethernet*
    - *Layer 2 Switching and Bridging*
    - *LAN Switching*

- Explain the fundamental concepts associated with the Ethernet media access technique
    - *Address Resolution Protocol (ARP)*
    - *Layer 2 Switching and Bridging*
    - *Layer 1 and Layer 2 Ethernet*
    - *LAN Switching*

- Describe how the protocols associated with TCP/IP allow host communication to occur
    - *IP Routing*
    - *Access Denied: Network Security with Cisco Routers*
    - *Address Resolution Protocol (ARP)*

OSI Reference Model
Network Management
The Other VPNs: It's Not All MPLS

• Describe the operation of the Internet Control Message Protocol (ICMP) and identify the reasons, types and format of associated error and control messages

Access Denied: Network Security with Cisco Routers
Network Management
ISDN and DDR
WAN Protocols

• Describe the principles and practice of packet switching utilizing the Internet Protocol (IP)

Address Resolution Protocol (ARP)
LAN Switching
Access Denied: Network Security with Cisco Routers
Layer 2 Switching and Bridging
ISDN and DDR