CompTIA Network+ Study Guide

N10-006

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Introduction to CompTIA Network+

CompTIA's Network+ certification covers the fundamentals of networking. The N10-006 exam is very extensive and covers a lot of networking information in great detail.

At Phoenix TS, we believe that a proper study routine is an important part of earning any certification. Whether you studied alone or attended an instructor-led course, this guide aims to:

- Establish effective study habits
- Give you insight into the exam topics
- Explain what it's like to take a CompTIA exam
- Provide sample questions to gain familiarity with similar exam content and gauge your level of understanding

According to CompTIA, the exam follows these objectives:

N10-006 Exam Topics:

- Network Architecture
- Network Operations
- Network Security
- Troubleshooting
- Industry Standards, Practices, and Network Theory

In this study guide, we break down the topics into material you need to know. This guide is not meant to be a replacement for a text book or class, but rather a supplement to help you focus on key areas of the Net+ exam.

What's on the Exam?

Network+ is an intense exam. The best way to study is to focus on a single topic at a time. The following list includes essential topics and concepts.

- **The OSI Model:** I can't stress this enough. Know the layers and be able to figure out what layer a given subject will operate on.
- **Networks by Geography:** Identify the differences between LAN, MAN, WAN, CAN, and PAN.
- **Network Topologies:** Be able to describe and list pros/cons of bus, ring, star, and hub-and-spoke topologies. Be familiar with partial and full mesh topology and hybrid topologies.
- **Identification of Components:** Describe and identify Ethernet, fiber optics (multimode and single mode), UTP/STP, wireless technologies, hubs, bridges, switches and more. This includes special use technology such as firewalls, proxy servers, and DNS. Be able to describe virtualization technologies and VoIP.
- **Ethernet:** You should have a deep pool of Ethernet knowledge, including speed/distance limitations, Ethernet switches, power over Ethernet, and port monitoring. This isn't an all inclusive list, but this is another topic you will want to spend more time on.
- **Patches/Updates:** (new to N10-006) While you may be familiar with applying these to your personal machine, there is a set of best practices that you need to know.
- **IP addresses:** Understand IPv4/6, sub-netting, binary conversion, and DHCP.
- **WANs:** Know all you can about WANs including data rates, PPP, ISDN POTS, DSL, and SONET. Be able to compare WAN technologies, differentiate between circuit and packet switched connections, and know about cellular network technology.
- **Physical Security:** (new to N110-006) Understand token authentication, man traps, and more. This section is pretty straightforward, but make sure you know the terms such as network closets, door access controls, IP cameras, biometrics, cipher locks, and other relevant terms.
- **Wireless Connections:** This section covers WLAN types, routers, access points, and wireless network security. If you've been through A+ a lot of this will be familiar, except for WLAN types (IBSS, BSS, ESS) You should also know about overlapping channels and have a thorough knowledge of 802.11 standards (frequency, speed, range)
- **Network Optimization:** This section is fairly short, but important! This covers network redundancy, QoS, configuration, and making networks have high availability. You should be able to make the most of low speed networks, select proper network devices, consider and compensate for environmental factors, and subnet IP's to support the needs of a client.
- **Command Line Utilities:** If you've got an A+ certification, you should understand the majority of this material, but there is some additional content. Commands to be familiar with include ipconfig, arp, nbtstat, netstat, nslookup, ping, route, and tracert. Be sure you know some common switches as well.
- **UNIX Commands:** Know a few UNIX commands, but this is not as in-depth as the Windows commands. Commands to know include ifconfig, arp, dig, host, traceroute, and ping. Know common arguments (like switches) for these commands.
- **Network Management:** This section covers network configuration, cable testing, monitoring tools, and various other tools to troubleshoot, maintain, setup, and optimize networks.

- **Network Security:** Know how to implement, maintain, and optimize security for various network types. Understand how to respond to and recover from data breaches. Know the various avenues of attacks, names of attacks (phishing, root-kit, worm) and how to defend the networks from the common attacks.
- **Troubleshooting:** This section is the most heavily weighted on the N10-006 exam. Be able to troubleshoot physical devices, data link layer issues, and network layer issues. It's important to be able to troubleshoot issues for various network types, and to follow the best practices for troubleshooting.
- **Forensics:** (new to N10-006) As an admin or tech, you may be the first to arrive at a workstation where malicious or illegal activity occurred. Net+ expects you to know what basic steps to take to ensure data integrity, and what to avoid to ensure that any evidence found remains admissible in court.
- **Change Management:** Understand the proper procedures for implementing changes in a network. Just remember the basic steps you should take to ensure a smooth transition.
- **Subnetting:** This is a topic that many students seem to stress over. You will need to know how to do binary to decimal conversion (and vice versa) and understand how you can break down an IP address into multiple subnets. Similar techniques will also be used for route aggregation, which is the simplification of a routing table down to as few addresses as possible.
- **Routing tables:** Make sure you know how these can be simplified, how to read them, and how to configure them statically.

Tackling the Exam

CompTIA exams are only administered in qualified testing centers under tightly controlled conditions. You will not be allowed to take any personal belongings into the testing room with you, however many facilities offer a locker to store belongings. You will however need two valid forms of identification (one with a photo of you) such as a drivers license and credit card. Contact your testing center if you are unsure what is acceptable.

Since you will be taking the N110-006 exam, it's important to note that you will not be allowed to bring, nor be provided with a calculator. You should be sure you are comfortable doing subnetting calculations by hand. Scrap paper will be provided.

The test itself is taken at a computer workstation, and performance based questions will be completed in an interactive software environment on that same station. You can skip and return to any question at any time so long as you are within the permitted time allotment.

Format

You should expect the following format when taking your N110-006 exam:

- Multiple choice and performance based questions
- A maximum of 90 questions (you may have less)
- 90 minute time limit to complete the exam
- Scoring is on a scale of 100-900 with a passing score of 720

Practice Questions

1. Which of the following typically reside on layer 3 of the OSI model? (choose all that apply)

    A. Router
    B. Ethernet
    C. TCP/IP
    D. A switch with IP routing capability

2. How would you establish a secure connection to your home office from a public WiFi?

    A. Firewall
    B. Proxy Server
    C. Link aggregation
    D. VPN

3. Which Protocol allows you to implement control over multiple access points?

    A. LWAPP
    B. IDS
    C. DHCP
    D. IEEE 802.1x

4. Which of these Windows commands will show you the physical address of a device on the local network?

    A. Arp -v
    B. Arp –g
    C. Arp –d
    D. Arp –s

5. Which standard will allow you to limit access to a network?

    A. HIDS
    B. IEEE 802.3
    C. RTSP
    D. IEEE 802.1x

6.Convert the following IP address to binary: 10.1.0.47

    A. 00010010.00000001.00000000.00110001
    B. 00001010.00000001.00000000.00100001
    C. 00001010.00000001.00000000.00101111
    D. 00001110.00000001.00000000.00100001

7. What keeps a packet from existing on an infinite loop within a network using IPv6?

    A. TTL
    B. Packet aggregation
    C. Degradation
    D. Hop Limit

8. Which of these contain two fiber optic wires in one connection?

    A. ST
    B. FC
    C. SC
    D. LC
    E. MT-RJ
    F. None of the above

9. You are trying to connect two ethernet switches that support Auto MDIX, which cables would function properly with this connection? (choose all that apply)

    A. Straight through
    B. Crossover
    C. Rollover
    D. MT-RJ

10. Which of the following can convert a workstations inside local IP address to an outside global, and allows port forwarding?

    A. DHCP
    B. NAT
    C. DNS
    D. Link Aggregation

11. To prevent router advertisements from broadcasting the information back to the source, what measure is used?

    A. Split Horizon
    B. APC
    C. Load Balancing
    D. None of the above

12. What method can be used to restrict network connections to a list of known devices via their physical address?

    A. WPA2
    B. Assigning static IP addresses
    C. Disabling SSID
    D. Enabling MAC filtering

13. You are troubleshooting a computer that seems unable to connect to the internet. When typing in web addresses, the PC is unable to access any site, but a ping of that site's IP shows that the PC can connect. Of the following, what is most likely the problem?

    A. Incorrect Network adaptor configuration
    B. Mismatched MDI/MDIxdevices
    C. Incorrect DNS configuration
    D. Incorrect default gateway

14. A small business is having trouble with their VoIP connection, you have determined that a busy network is to blame. Of the following, what is the BEST way to resolve their issue?

    A. Configure Quality of Service on the Router
    B. Configure Denial of Service on the Router
    C. Packet Aggregation
    D. Restrict employee network use to certain times of the day

15. Which of the following would be used in a WAN network? (select all that apply)

    A. LTE
    B. Single Mode Fiber
    C. CAT 6a
    D. Wi-Max

16. How much delay, jitter, and packet loss is acceptable for video streaming?

    A. 150ms delay, 30ms jitter, 1 percent packet loss
    B. 125ms delay, 30ms jitter, 1percent packet loss
    C. 150ms delay, 35ms jitter, 1percent packet loss
    D. None of these

17. What command would you use on a UNIX system to add a device to the ARP? The device's IP is 192.168.1.97 and its MAC address is 01:23:34:56:78:90, it is available off of interface en1.

    A. Arp –S 192.168.1.97 01:23:34:56:78:90 ifscopeen1
    B. ifconfig192.168.1.97 01:23:34:56:78:90 ifscopeen1
    C. arp –d Arp –s 192.168.1.97 01:23:34:56:78:90 ifscopeen1
    D. arp –s 192.168.1.97 01:23:34:56:78:90 ifscopeen1

18. What is SONET?

    A. A standard to unify telecommunications and computer networks
    B. A PPP network
    C. Multiplexing different signals over a fiber optic connection.
    D. A Network with speeds over OC-192

19.What is the bandwidth of STS-1/SDM-0

    A. 155.52 Mbps
    B. 45.12 Mbps
    C. 480 Mbps
    D. 51.84 Mbps

20. A client in the USA has a SOHO WLAN that is performing poorly. It is using a 802.11g WAP/ compatible devices. Upon investigating you find that the WLAN is configured to channel 1, and a nearby network is on channel 1 as well. No other networks are nearby. What channel could you select to prevent the neighboring network from interfering? (choose all that apply)

    A. 5
    B. 6
    C. 11
    D. 14

21. Which of the following is NOT an example of distance vector protocol?

    A. RIPv2
    B. OSPF
    C. BGP
    D. RIP

22. Which of the following are private IP ranges? (choose all that apply)

    A. 10.0.0.0 –10.255.255.254
    B. 172.16.0.0 –172.31.255.255
    C. 171.16.0.0 –172. 47.255.255
    D. 192.168.0.0 –192.168.255.255

23. Which of these is an example of EGP?

    A. IGP
    B. AS
    C. BGP
    D. OSPF

24. How can you best protect devices from malware without having anti-malware installed in the local device?

    A. Proxy Server
    B. Cloud/Server Based Anti-Malware
    C. Use trusted connections
    D. Configure Ports

25. Given a subnet mask of 255.255.224.0, figure the prefix notation.

    A. 255.255.224.0/18
    B. 255.255.224.0/19
    C. 255.255.224.0/20
    D. 255.255.224.0/21
    E. More information is required

26. Which of the following is NOT effective way to secure a server room?

    A. Man Trap
    B. Security Guard
    C. RFID Token
    D. Token Ring

27. What is the primary method IDS and IPS technology uses to detect and prevent attacks?

    A. Anomaly based detection
    B. Signature based detection
    C. Policy based detection
    D. IDS and IPS are not security technologies.

28. Which of these routing protocols is based on the link speed between routers?

    A. RIP
    B. EIGRP
    C. BGP
    D. OSPF

Answer Sheet

1. A and D. Routers are layer 3, and a switch with IP routing capability is considered layer 3 as well.
2. D. VPN's allow for a secure connection over an unsecure network.
3. A. LWAPP (Lightweight access point protocol)
4. B. Arp –g the -g switch is also the same as –a
5. IEEE 802.1x allows you to limit network access by requiring individual authentication for users.
6. C. If you got this wrong be sure to review and practice binary math!
7. D. Hop limit. TTL (Time to live) is used in IPv4, it's equivalent in IPv6 is known as the hop count.
8. E. MT-RJ is the only fiber connector listed that contains two fibers in a single connector.
9. A and B. If both devices use Auto MDI-x you can use either straight through or cross over cables to connect them, and they will adjust accordingly. Remember that this requires the data rate and duplex setting be set to "auto" to function properly.
10. B. NAT can convert local IP's to global IP's. This can be done both within a subnet, as well as through the internet to hide a users IP and direct traffic to specific ports.
11. A. Split Horizon. When a router sends data confirming that a particular network is reachable, and directs it to the next IP to use for it's final destination, this is called route advertisement. Split horizon prevents the router receiving these directions from broadcasting them back to the source.
12. D. MAC filtering allows you to limit network access to devices with a particular network address. This isn't a particularly strong means of security, as a skilled hacker could easily spoof one of those IP's after monitoring network traffic.
13. C. The DNS configuration is what translates text names to IP addresses that the computer can use. If this service is configured incorrectly, or the server is down, you will not be able to access websites by typing domain names.
14. A. Quality of service (QoS) will allow you to ensure proper bandwidth specific network traffic.
15. A, B, and D. LTE, Single mode fiber, and Wi-Max are all WAN technologies.
16. A. VoIP can run with a maximum of150ms delay, 30ms jitter, 1% packet loss.
17. D. If you thought the answer was A you were close. Pay attention to the upper case letters, these invalidate the command. UNIX's command line is case sensitive.
18. C. SONET is a protocol that allows multiplexing (transferring of multiple bit streams synchronously) over a fiber optic connection.
19. D. STS-1/SDM-0 both offer 51.84 Mbps bandwidth.
20. B, and C WiFichannels on a 2.3 Ghzneed to have a 5 channel separation. Channel 14 is the exception to this, as it does not overlap 11, but it's use by the public has been banned by the FCC. 5Ghz channels do not overlap.
21. B. OSPF is a link-state routing protocol.
22. B and D are private IP address ranges. A is almost correct but ends in 254 instead of 255, and C's second octet is incorrect
23. C. BGP (Border Gateway Protocol) connectsseparate AS's (autonomous systems) such as ISP's. IGP is used for data transfer between routers within the same AS.
24. B. Cloud/server based anti-malware operates independent of the system, preventing strain on resources and improving the end user experience.

25. B. 255.255.224.0/19 is correct. There are two octets of 255, which have eight contiguous ones, and one octet of 224 which has 3 contiguous ones. 8 + 8 +3 =19, hence the /19.
26. D. Token Ring is a Network Topology.
27. A. Anomaly based detection. The continuous monitoring of a proprietary network for unusual events or trends.
28. D. OSFP (open shortest path first) finds it's way based off of the fastest connections available.

Study Habits

Without good study habits, it's going to be hard to pass any CompTIA exam. Try to integrate these habits into your study routine so you can learn quickly and efficiently!

1. **Consistency:** Establish a routine so that you fall into the habit of studying frequently.
2. **Flash Cards:** These will help you memorize those facts you're having difficulty with. Be sure to include cards with information you're comfortable with to reinforce it further!
3. **Your Study Area:** One of the most important aspects of good study habits is your environment. Remove distractions (like your phone) and find a clean quiet area to work.
4. **Hands-on Experience:** Wherever possible, physically do tasks you are learning about. For many people this kind of learning sticks with them longer and provides a better understanding of the subject material.
5. **Ask Questions:** If you are struggling with a particular topic, don't be afraid to seek out help. If you are attending a class ask your instructor, if you are self-studying you might be able to seek out help via web forums or through personal connections.
6. **Eat Well and Rest:** Arguably one of the most important aspects of a good study routine. Make sure you have proper nutrition, and get a good night's sleep daily. Both of these will help with energy levels and focus; you will find yourself struggling to learn if you are tired or hungry! Over studying can leave you feeling burnt out, be sure to pace yourself.

Exam Day

There are a few things you can do to improve your performance on exam day. Here are a few final tips for you as it comes time to take the test.

- In the few days before your exam, review lightly and focus in on any last bits of information you might still have a little trouble memorizing.
- Don't cram in the days beforehand, you won't remember the material well, and you will just be tired of looking at Net+ information by exam day which will lead to poor performance.
- Get a good night's sleep the night before your exam, and eat a good breakfast. Hunger and fatigue are the enemy of your ability to focus.
- Scheduling your exam later in the day will allow you to avoid rush hour traffic, a calm drive to the testing center can help reduce stress on exam day!
- Arrive early to your appointment, this will give you time to settle your nerves before you go in and ensure that you don't miss your scheduled time.
- Don't forget to leave any electronic devices at home or in your car unless you want to leave them in a locker at the testing center
- Read the questions carefully and take your time. If you have time, review all your answers before you submit the exam