

Transition Guide for Logical Operations-based *The Official CompTIA® Network+® (Exam N10-007)* to *The Official CompTIA® Network+® (Exam N10-007): 2019 Update*

This bridge document is written for instructors who have used the previous *The Official CompTIA Network+ Guides (Exam N10-007)* courseware, and who are looking to come up to speed on the new version quickly and efficiently.

High-Level Overview of Course Design Changes

This edition of the course has been redesigned compared to the order in which lessons and topics were presented in the previous *The Official CompTIA Network+ Guides (Exam N10-007)* edition.

The course retains the familiar division into Lessons and Topics. A greater number of Lessons (16 compared to 14) is used. The content sequence has been revised, with early Lessons following the OSI model, before proceeding through monitoring and troubleshooting to network security concepts. The course concludes by revisiting lower layer OSI model concepts in more detail, looking at site-based implementation of cabling, wireless, WAN links, and operations management.

There are no changes to the exam and exam objectives.

Course Outline Comparison

This table compares the outline of the prior **The Official CompTIA Network+ Guides (Exam N10-007)** courseware to that of the new **The Official CompTIA Network+ Guides (Exam N10-007): 2019 Update** courseware.

The Official CompTIA Network+ Guides (Exam N10-007)	The Official CompTIA Network+ Guides (Exam N10-007): 2019 Update
Lesson 1: Network Theory	Lesson 1: Explaining the OSI and TCP/IP Models
Lesson 2: Bounded Network Media	Lesson 2: Explaining Properties of Network Traffic
Lesson 3: Unbounded Network Media	Lesson 3: Installing and Configuring Switched Networks
Lesson 4: Network Implementations	Lesson 4: Configuring IP Networks
Lesson 5: TCP/IP Addressing and Data Delivery	Lesson 5: Installing and Configuring Routed Networks
Lesson 6: Routing and Switching	Lesson 6: Configuring and Monitoring Ports and Protocols
Lesson 7: TCP/IP Implementation	Lesson 7: Explaining Network Application and Storage Issues
Lesson 8: Network Security Analysis	Lesson 8: Monitoring and Troubleshooting Networks

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Lesson 9: Network Security Implementation	Lesson 9: Explaining Networking Attacks and Mitigations
Lesson 10: WAN Infrastructure	Lesson 10: Installing and Configuring Security Devices
Lesson 11: Cloud and Virtualization Techniques	Lesson 11: Explaining Authentication and Access Controls
Lesson 12: Remote Networking	Lesson 12: Deploying and Troubleshooting Cabling Solutions
Lesson 13: Network Management	Lesson 13: Implementing and Troubleshooting Wireless Technologies
Lesson 14: Troubleshooting Network Issues	Lesson 14: Comparing and Contrasting WAN Technologies
	Lesson 15: Using Remote Access Methods
	Lesson 16: Identifying Site Policies and Best Practices

Course Setup Changes

The setup for this course has changed from having a classroom Windows Server 2016 server and each student and the instructor having a Windows 10 Pro client workstation, to each student having a Windows 10 host computer running Hyper-V with virtual machines pre-configured. The guest VMs include a Windows Server 2016 domain controller, a Windows Server 2016 web and email server, Ubuntu and CentOS servers, Windows 7 and Windows 10 clients, VyOS routers, pfSense and Security Onion security appliances, and the KALI Linux security testing platform.

Virtual machine images for all Linux-based guests are provided, as well as the scripts required to implement installations of Windows machines. As always, training providers are responsible for meeting licensing requirements for any software used in the classroom.

A complete and detailed setup guide document is available for download from the CompTIA CHOICE platform.

Note: If you have already set up *The Official CompTIA A+ Guides (Exam 220-1102): 2019 Update* or *The Official CompTIA Network+ Guides (Exam SY0-501): 2019 Update* course, you can update the setup using provided script files to make the required changes for this course.

Activity Design Changes

In this edition of Network+, the hands-on activities that use the VMs have been implemented using a reset script, so that each activity can be keyed independently. Scripted steps are provided so that students can reset their environments to a base state when they complete each one. Hands-on activities have been re-conceived as longer, more comprehensive, lab-style exercises, so you will probably want to review them to see where you might need to tailor your instructional delivery from the prior, more discrete task-based approach.

In addition, extensive review and discussion activities have been added on a topic-by-topic basis. As always, sample responses for students are found in the Solutions section in the back of the student guide.

Other Course Changes

In addition to the course set-up and activity changes, we've also added some additional features to help support your students in their learning.

In the Assessments tile in CompTIA CHOICE, you will find a variety of different assessments that students can take related to the lesson content as well as course-wide final assessment. These assessments can be used for self-study by students or as homework in your course.

In the Video tile in CompTIA CHOICE, you will find access to different videos that can be incorporated into the course. These videos, developed exclusively for CompTIA by ITPro.TV, provide demonstrations of key activities in the course. These are a good alternative to show if you do not have

access to all equipment mentioned in the course. Video icons in the course content also alert you and your students to videos that relate to the content covered.

Exam Mapping Comparison

This table compares the mapping of the prior **The Official CompTIA Network+ (Exam N10-007)** courseware to that of the new **The Official CompTIA Network+ (Exam N10-007): 2019 Update** courseware.

Domain and Objective	The Official CompTIA Network+ (Exam N10-007)	The Official CompTIA Network+ (Exam N10-007): 2019 Update
Domain 1.0 Networking Concepts		
1.1 Explain the purposes and uses of ports and protocols.		
Protocols and ports	Topic 7A	Topics 4F, 6D, 7A, 7B, 8A, 11B, 15B
SSH22	Topic 7A	Topic 15B
DNS 53	Topic 7A	Topic 6D
SMTP 25	Topic 7A	Topic 7A
SFTP 22	Topic 7A	Topic 15B
FTP 20, 21	Topic 7A	Topic 15B
TFTP 69	Topic 7A	Topic 15B
TELNET 23	Topic 7A	Topic 15B
DHCP 67, 68	Topic 7A	Topic 4F
HTTP 80	Topic 7A	Topic 7A
HTTPS 443	Topic 7A	Topic 7A
SNMP 161	Topic 7A	Topic 8A
RDP 3389	Topic 7A	Topic 15B
NTP 123	Topic 7A	Topic 7A
SIP 5060, 5061	Topic 7A	Topic 7B
SMB 445	Topic 7A	Topic 7A
POP 110	Topic 7A	Topic 7A
IMAP 143	Topic 7A	Topic 7A
LDAP 389	Topic 7A	Topic 11B
LDAPS 636	Topic 7A	Topic 11B
H.323 1720	Topic 7A	Topic 7B
Protocol types	Topic 5A	Topics 4A, 4B, and 6A
ICMP	Topic 5A	Topic 4B
UDP	Topic 5A	Topic 6A
TCP	Topic 5A	Topic 6A
IP	Topic 5A	Topic 4A

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Connection-oriented vs. connectionless	Topic 5A	Topic 6A
1.2 Explain devices, applications, protocols and services at their appropriate OSI layers.		
Layer 1 – Physical	Topic 1B	Topic 1A
Layer 2 – Data Link	Topic 1B	Topic 1A
Layer 3 – Network	Topic 1B	Topic 1A
Layer 4 – Transport	Topic 1B	Topic 1A
Layer 5 – Session	Topic 1B	Topic 1A
Layer 6 – Presentation	Topic 1B	Topic 1A
Layer 7 – Application	Topic 1B	Topic 1A
1.3 Explain the concepts and characteristics of routing and switching.		
Properties of network traffic		Topics 1A, 2A, 2B, 2C and 4E
Broadcast domains	Topic 6A	Topic 2A
CSMA/CD	Topic 1C	Topic 2A
CSMA/CA	Topic 1C	Topic 2A
Collision domains	Topic 6A	Topic 2A
Protocol data units	Topics 1B and 6A	Topic 1A
MTU	Topics 6B and 11B	Topic 2B
Broadcast	Topics 1C, 3A, 3C, 4C, 5C, 5D, 6A and 6B	Topic 2C
Multicast	Topics 1C, 5E and 6B	Topic 4E
Unicast	Topics 1C and 5E	Topic 2C
Segmentation and interface properties		Topics 2C, 3B, 9B and 9C
VLANs	Topic 6D	Topic 9B
Trunking (802.1q)	Topic 6D	Topic 9B
Tagging and untagging ports	Topic 6D	Topic 9B
Port mirroring	Topic 6D	Topic 3B
Switching loops/spanning tree	Topic 6A	Topic 3B
PoE and PoE+ (802.3af, 802.3at)	Topic 4C	Topic 3B
DMZ	Topic 9F	Topic 9C
MAC address table	Topic 6A	Topic 3B
ARP table	Topic 6A	Topic 2C
Routing		Topic 5A
Routing protocols (IPv4 and IPv6)	Topics 6B and 6C	Topic 5A
Distance-vector routing protocols	Topics 6B and 6C	Topic 5A
RIP	Topic 6C	Topic 5A
EIGRP	Topic 6C	Topic 5A
Link-state routing protocols	Topics 6B and 6C	Topic 5A

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OSPF	Topic 6C	Topic 5A
Hybrid	Topics 6B and 6C	Topic 5A
BGP	Topic 6C	Topic 5A
Routing types	Topics 6B and 6C	Topic 5A
Static	Topics 6B and 6C	Topic 5A
Dynamic	Topics 6B and 6C	Topic 5A
Default	Topics 6B and 6C	Topic 5A
IPv6 concepts	Topic 5E	Topic 4E
Addressing	Topic 5E	Topic 4E
Tunneling	Topic 5E	Topic 4E
Dual stack	Topic 5E	Topic 4E
Router advertisement	Topic 5E	Topic 4E
Neighbor discovery	Topic 5E	Topic 4E
Performance concepts	Topic 12C	Topic 7B
Traffic shaping	Topics 10C and 13D	Topic 7B
QoS	Topics 10C and 13D	Topic 7B
Diffserv	Topic 13D	Topic 7B
CoS	Topics 10C and 13D	Topic 7B
NAT/PAT	Topic 9F	Topic 9C
Port forwarding	Topic 9F	Topic 9C
Access control list	Topics 9B and 9F	Topic 9C
Distributed switching	Topic 6A	Topic 3D
Packet-switched vs. circuit-switched network	Topics 6A and 10A	Topic 1B
Software-defined networking	Topic 11A	Topic 3D
1.4 Given a scenario, configure the appropriate IP addressing components.		
Private vs. public	Topic 5C	Topic 4D
Loopback and reserved	Topic 5C	Topic 4D
Default gateway	Topic 5C	Topic 4A
Virtual IP	Topic 13D	Topic 5B
Subnet mask	Topics 5B, 5C, and 5D	Topic 4A
Subnetting	Topics 5B and 5D	Topics 4C and 4D
Classful	Topic 5C	Topic 4C
Classes A, B, C, D, and E	Topics 5C and 5D	Topic 4C
Classless	Topic 5D	Topics 4C, 4D and 4E
VLSM	Topic 5D	Topic 4D
CIDR notation (IPv4 vs. IPv6)	Topic 5D	Topics 4C and 4D
Address assignments	Topics 5B and 7A	Topics 4E and 4F
DHCP	Topic 7A	Topic 4F

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DHCPv6	Topic 7A	Topic 4F
Static	Topic 7A	Topic 4F
APIPA	Topic 7A	Topic 4F
EUI64	Topic 5E	Topic 4E
IP reservations	Topic 7A	Topic 4F
1.5 Compare and contrast the characteristics of network topologies, types and technologies.		
Wired topologies	Topic 4A	Topic 3C
Logical vs. physical	Topic 4A	Topic 3C
Star	Topics 4A and 4B	Topic 3C
Ring	Topics 4A and 4B	Topic 3C
Mesh	Topic 4A	Topic 3C
Bus	Topics 4A and 4B	Topic 3C
Wireless topologies	Topic 3C	Topic 13A
Mesh	Topic 3C	Topic 13A
Ad hoc	Topic 3C	Topic 13A
Infrastructure	Topic 3C	Topic 13A
Types	Topic 1A	Topic 3D
LAN	Topic 1A	Topic 3D
WLAN	Topic 1A	Topic 3D
MAN	Topic 1A	Topic 3D
WAN	Topic 1A	Topic 3D
CAN	Topic 1A	Topic 3D
SAN	Topic 11B	Topic 3D
PAN	Topic 1A	Topic 3D
Technologies that facilitate the Internet of Things (IoT)	Topic 3D	Topic 14D
Z-Wave	Topic 3D	Topic 14D
Ant+	Topic 3D	Topic 14D
Bluetooth	Topic 3D	Topic 14D
NFC	Topic 3D	Topic 14D
IR	Topic 3D	Topic 14D
RFID	Topic 3D	Topic 14D
802.11	Topic 3D	Topic 14D
1.6 Given a scenario, implement the appropriate wireless technologies and configurations.		
802.11 standards	Topic 3A	Topic 13A
a	Topic 3A	Topic 13A
b	Topic 3A	Topic 13A

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g	Topic 3A	Topic 13A
n	Topic 3A	Topic 13A
ac	Topic 3A	Topic 13A
Cellular	Topic 10C	Topic 14D
GSM	Topic 10C	Topic 14D
TDMA	Topic 10C	Topic 14D
CDMA	Topic 10C	Topic 14D
Frequencies	Topic 3A	Topic 13A
2.4 GHz	Topic 3A	Topic 13A
5.0 GHz	Topic 3A	Topic 13A
Speed and distance requirements	Topic 3A	Topic 13A
Channel bandwidth	Topic 3A	Topic 13A
Channel bonding	Topic 3A	Topic 13A
MIMO/MU-MIMO	Topic 3A	Topic 13A
Unidirectional/omnidirectional	Topic 3B	Topic 13A
Site surveys	Topics 3C, 9D, 13A	Topic 13A
1.7 Summarize cloud concepts and their purposes.		
Types of services	Topic 11C	Topic 7D
SaaS	Topic 11C	Topic 7D
PaaS	Topic 11C	Topic 7D
IaaS	Topic 11C	Topic 7D
Cloud delivery models	Topic 11C	Topic 7D
Private	Topic 11C	Topic 7D
Public	Topic 11C	Topic 7D
Hybrid	Topic 11C	Topic 7D
Connectivity methods	Topic 11C	Topic 7D
Security implications/considerations	Topic 11C	Topic 7D
Relationship between local and cloud resources	Topic 11C	Topic 7D
1.8 Explain the functions of network services.		
DNS service	Topic 7B	Topics 6C and 6D
Record types	Topic 7B	Topic 6D
A, AAAA	Topic 7B	Topic 6D
TXT (SPF, DKIM)	Topic 7B	Topic 6D
SRV	Topic 7B	Topic 6D
MX	Topic 7B	Topic 6D
CNAME	Topic 7B	Topic 6D
NS	Topic 7B	Topic 6D
PTR	Topic 7B	Topic 6D

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Internal vs. external DNS	Topic 7B	Topic 6D
Third-party/cloud-hosted DNS	Topic 7B	Topic 6D
Hierarchy	Topic 7B	Topic 6C
Forward vs. reverse zones	Topic 7B	Topic 6D
DHCP service	Topic 7A	Topic 4F
MAC reservations	Topic 7A	Topic 4F
Pools	Topic 7A	Topic 4F
IP exclusions	Topic 7A	Topic 4F
Scope options	Topic 7A	Topic 4F
Lease time	Topic 7A	Topic 4F
TTL	Topic 7A	Topic 4F
DHCP relay/IP helper	Topic 7A	Topic 4F
NTP	Topic 7D	Topic 7A
IPAM	Topic 7C	Topic 6D
Domain 2.0 Infrastructure		
2.1 Given a scenario, deploy the appropriate cabling solution.		
Types	Topics 2A and 2B	Topics 12A and 12D
Copper	Topic 2A	Topics 12A and 12B
UTP	Topic 2A	Topic 12B
STP	Topic 2A	Topic 12B
Coaxial	Topic 2A	Topic 12A
Fiber	Topic 2B	Topic 12D
Single-mode	Topic 2B	Topic 12D
Multimode	Topic 2B	Topic 12D
Plenum vs. PVC	Topic 2C	Topic 12B
Connector types	Topics 2A and 2B	Topics 12A, 12B and 12D
Copper	Topic 2A	Topics 12A and 12B
RJ-45	Topic 2A	Topic 12B
RJ-11	Topic 2A	Topic 12B
BNC	Topic 2A	Topic 12A
DB-9	Topic 2A	Topic 12A
DB-25	Topic 2A	Topic 12A
F-type	Topic 2A	Topic 12A
Fiber	Topic 2B	Topic 12D
LC	Topic 2B	Topic 12D
ST	Topic 2B	Topic 12D
SC	Topic 2B	Topic 12D
APC	Topic 2B	Topic 12D

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UPC	Topic 2B	Topic 12D
MTRJ	Topic 2B	Topic 12D
Transceivers	Topic 2B	Topic 12D
SFP	Topic 2B	Topic 12D
GBIC	Topic 2B	Topic 12D
SFP+	Topic 2B	Topic 12D
QSFP	Topic 2B	Topic 12D
Characteristics of fiber transceivers	Topic 2B	Topic 12D
Bidirectional	Topic 2B	Topic 12D
Duplex	Topic 2B	Topic 12D
Termination points	Topic 2C	Topic 12A
66 block	Topic 2C	Topic 12A
110 block	Topic 2C	Topic 12A
Patch panel	Topic 2C	Topic 12A
Fiber distribution panel	Topic 2C	Topic 12A
Copper cable standards	Topic 2A	Topics 12A and 12B
Cat 3	Topic 2A	Topic 12B
Cat 5	Topic 2A	Topic 12B
Cat 5e	Topic 2A	Topic 12B
Cat 6	Topic 2A	Topic 12B
Cat 6a	Topic 2A	Topic 12B
Cat 7	Topic 2A	Topic 12B
RG-6	Topic 2A	Topic 12A
RG-59	Topic 2A	Topic 12A
Copper termination standards	Topic 2C	Topic 12B
TIA/EIA 568a	Topic 2C	Topic 12B
TIA/EIA 568b	Topic 2C	Topic 12B
Crossover	Topic 2C	Topic 12B
Straight-through	Topic 2C	Topic 12B
Ethernet deployment standards	Topic 4C	Topic 2B
100BaseT	Topic 4C	Topic 2B
1000BaseT	Topic 4C	Topic 2B
1000BaseLX	Topic 4C	Topic 2B
1000BaseSX	Topic 4C	Topic 2B
10GBaseT	Topic 4C	Topic 2B
2.2 Given a scenario, determine the appropriate placement of networking devices on a network, and install/configure them.		
Firewall	Topic 4D	Topic 10A

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Router	Topic 4D	Topic 5B
Switch	Topic 4D	Topic 3B
Hub	Topic 4D	Topic 3A
Bridge	Topic 4D	Topic 3A
Modems	Topic 4D	Topic 14B
Wireless access point	Topic 3B	Topic 13A
Media converter	Topic 2C	Topic 12D
Wireless range extender	Topic 3B	Topic 13A
VoIP endpoint	Topic 10D	Topic 7B
2.3 Explain the purposes and use cases for advanced networking devices.		
Multilayer switch	Topic 4D	Topic 7B
Wireless controller	Topic 3B	Topic 13A
Load balancer	Topic 4D	Topic 7B
IDS/IPS	Topic 9F	Topic 10B
Proxy server	Topic 9F	Topic 10A
VPN concentrator	Topic 12C	Topic 15A
AAA/RADIUS server	Topics 9A and 9D	Topic 11B
UTM appliance	Topic 9B	Topic 10B
NGFW/Layer 7 firewall	Topic 7C	Topic 10A
VoIP PBX	Topic 10D	Topic 7B
VoIP gateway	Topic 10D	Topic 7B
Content filter	Topic 9B	Topic 10A
2.4 Explain the purposes of virtualization and network storage technologies.		
Virtual networking components	Topic 11A	Topic 7C
Virtual switch	Topic 11A	Topic 7C
Virtual firewall	Topic 11A	Topic 7C
Virtual NIC	Topic 11A	Topic 7C
Virtual router	Topic 11A	Topic 7C
Hypervisor	Topic 11A	Topic 7C
Network storage types	Topic 11B	Topic 7C
NAS	Topic 11B	Topic 7C
SAN	Topic 11B	Topic 7C
Connection type	Topic 11B	Topic 7C
FCoE	Topic 11B	Topic 7C
Fibre Channel	Topic 11B	Topic 7C
iSCSI	Topic 11B	Topic 7C
InfiniBand	Topic 11B	Topic 7C

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Jumbo frame	Topic 11B	Topic 7C
2.5 Compare and contrast WAN technologies.		
Service type	Topic 10C	Topics 14A and 14
ISDN	Topics 10A and 10C	Topic 14B
T1/T3	Topic 10C	Topic 14A
E1/E3	Topic 10C	Topic 14A
OC-3—OC-192	Topic 2B	Topic 14A
DSL	Topic 10B	Topic 14B
Metropolitan Ethernet	Topic 10C	Topic 14A
Cable broadband	Topic 10B	Topic 14B
Dial-up	Topic 10B	Topic 14B
PRI	Topic 10C	Topic 14B
Transmission mediums	Topic 10C	Topics 14A, 14B and 14D
Satellite	Topics 10B and 10C	Topic 14D
Copper	Topics 10B and 10C	Topics 14A and 14B
Fiber	Topics 10B and 10C	Topics 14A and 14B
Wireless	Topics 10B and 10C	Topic 14D
Characteristics of service		Topics 14C and 15A
MPLS	Topic 10C	Topic 14C
ATM	Topic 10C	Topic 14C
Frame relay	Topic 10C	Topic 14C
PPPoE	Topic 10B	Topic 14C
PPP	Topic 10B	Topic 14C
DMVPN	Topic 12C	Topic 15A
SIP trunk	Topic 10D	Topic 14C
Termination	Topic 10A	Topic 14B
Demarcation point	Topic 10A	Topic 14B
CSU/DSU	Topic 10A	Topic 14B
Smart Jack	Topic 10A	Topic 14B
Domain 3.0 Network Operations		
3.1 Given a scenario, use appropriate documentation and diagrams to manage the network.		
Diagram symbols	Topic 13B	Topic 16A
Standard operating procedures/work instructions	Topic 13B	Topic 16A
Logical vs. physical diagrams	Topic 13B	Topic 16A
Rack diagrams	Topic 13B	Topic 16A
Change management documentation	Topic 13B	Topic 16A
Wiring and port locations	Topic 13B	Topic 16A

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IDF/MDF documentation	Topic 13B	Topic 16A
Labeling	Topic 13B	Topic 16A
Network configuration and performance baselines	Topic 13C	Topic 16A
Inventory management	Topic 13B	Topic 16A
3.2 Compare and contrast business continuity and disaster recovery concepts.		
Availability concepts		Topic 16C
Fault tolerance	Topic 13E	Topic 16C
High availability	Topic 13E	Topic 16C
Load balancing	Topics 4D and 13D	Topic 16C
NIC teaming	Topic 13E	Topic 16C
Port aggregation	Topic 13E	Topic 16C
Clustering	Topic 13E	Topic 16C
Power management	Topic 13E	Topic 16C
Battery backups/UPS	Topic 13E	Topic 16C
Power generators	Topic 13E	Topic 16C
Dual power supplies	Topic 13E	Topic 16C
Redundant circuits	Topic 13E	Topic 16C
Recovery	Topic 13E	Topic 16C
Cold sites	Topic 13E	Topic 16C
Warm sites	Topic 13E	Topic 16C
Hot sites	Topic 13E	Topic 16C
Backups	Topic 13E	Topic 16C
Full	Topic 13E	Topic 16C
Differential	Topic 13E	Topic 16C
Incremental	Topic 13E	Topic 16C
Snapshots	Topic 13E	Topic 16C
MTTR	Topic 13E	Topic 16C
MTBF	Topic 13E	Topic 16C
SLA requirements	Topic 13E	Topic 16C
3.3 Explain common scanning, monitoring, and patching processes and summarize their expected outputs.		
Processes		Topics 6B, 8A and 11E
Log reviewing	Topic 13A	Topic 8A
Port scanning	Topic 13A	Topic 6B
Vulnerability scanning	Topic 13A	Topic 11E
Patch management	Topic 9E	Topic 11E
Rollback	Topic 9E	Topic 11E

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Reviewing baselines	Topic 13C	Topic 8A
Packet/traffic analysis	Topic 13A	Topic 6B
Event management	Topic 13A	Topic 8A
Notifications	Topic 13A	Topic 8A
Alerts	Topic 13A	Topic 8A
SIEM	Topic 13A	Topic 8A
SNMP monitors	Topic 13A	Topic 8A
MIB	Topic 13A	Topic 8A
Metrics	Topic 13A	Topic 8A
Error rate	Topic 13A	Topic 8A
Utilization	Topic 13A	Topic 8A
Packet drops	Topic 13A	Topic 8A
Bandwidth/throughput	Topic 13A	Topic 8A
3.4 Given a scenario, use remote access methods.		
VPN	Topic 12C	Topic 15A
IPSec	Topic 12C	Topic 15A
SSL/TLS/DTLS	Topic 12C	Topic 15A
Site-to-site	Topic 12C	Topic 15A
Client-to-site	Topic 12C	Topic 15A
RDP	Topics 7D, 9A and 12A	Topic 15B
SSH	Topic 12B	Topic 15B
VNC	Topic 9A	Topic 15B
Telnet	Topic 12B	Topic 15B
HTTPS/management URL	Topic 12B	Topic 15B
Remote file access	Topic 12B	Topic 15B
FTP/FTPS	Topic 12B	Topic 15B
SFTP	Topic 12B	Topic 15B
TFTP	Topic 12B	Topic 15B
Out-of-band management	Topic 12B	Topic 15B
Modem	Topic 12B	Topic 15B
Console router	Topic 12B	Topic 15B
3.5 Identify policies and best practices.		
Privileged user agreement	Topic 8B	Topic 16D
Password policy	Topic 8B	Topic 16D
On-boarding/off-boarding procedures	Topic 8B	Topic 16D
Licensing restrictions	Topic 8B	Topic 16D
International export controls	Topic 8B	Topic 16D
Data loss prevention	Topic 8D	Topic 16D
Remote access policies	Topic 8B	Topic 16D

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Incident response policies	Topic 8B	Topic 16D
BYOD	Topic 8B	Topic 16D
AUP	Topics 8B and 13B	Topic 16D
NDA	Topic 8B	Topic 16D
System life cycle	Topic 13B	Topic 16D
Asset disposal	Topic 13B	Topic 16D
Safety procedures and policies	Topic 14B	Topic 16D
Domain 4.0 Network Security		
4.1 Summarize the purposes of physical security devices.		
Detection	Topic 8C	Topic 16B
Motion detection	Topic 8C	Topic 16B
Video surveillance	Topic 8C	Topic 16B
Asset tracking tags	Topic 8C	Topic 16B
Tamper detection	Topic 8C	Topic 16B
Prevention	Topic 8C	Topic 16B
Badges	Topic 8C	Topic 16B
Biometrics	Topic 8C	Topic 16B
Smart cards	Topic 8C	Topic 16B
Key fob	Topic 8C	Topic 16B
Locks	Topic 8C	Topic 16B
4.2 Explain authentication and access controls.		
Authorization, authentication and accounting	Topic 9A	Topics 11A and 11B
RADIUS	Topic 9A	Topic 11B
TACACS+	Topic 9A	Topic 11B
Kerberos	Topic 9A	Topic 11B
Single sign-on	Topic 9A	Topic 11A
Local authentication	Topic 9A	Topic 11B
LDAP	Topic 9A	Topic 11B
Certificates	Topic 9A	Topic 11B
Auditing and logging	Topic 8A	Topic 11B
Multifactor authentication	Topic 9A	Topic 11A
Something you know	Topic 9A	Topic 11A
Something you have	Topic 9A	Topic 11A
Something you are	Topic 9A	Topic 11A
Somewhere you are	Topic 9A	Topic 11A

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Something you do	Topic 9A	Topic 11A
Access control	Topic 9B	Topics 11B and 11C
802.1X	Topic 9B	Topic 11C
NAC	Topic 9B	Topic 11C
Port security	Topic 9C	Topic 11C
MAC filtering	Topic 9D	Topic 11C
Captive portal	Topic 9D	Topic 11C
Access control lists	Topics 3C, 9B and 9F	Topic 11B
4.3 Given a scenario, secure a basic wireless network.		
WPA	Topic 9D	Topic 13C
WPA2	Topic 9D	Topic 13C
TKIP-RC4	Topic 9D	Topic 13C
CCMP-AES	Topic 9D	Topic 13C
Authentication and authorization	Topic 9D	Topic 13C
EAP	Topic 9D	Topic 13C
PEAP	Topic 9D	Topic 13C
EAP-FAST	Topic 9D	Topic 13C
EAP-TLS	Topic 9D	Topic 13C
Shared or open	Topic 9D	Topic 13C
Preshared key	Topic 9D	Topic 13C
MAC filtering	Topic 9D	Topic 13C
Geofencing	Topic 9D	Topic 13C
4.4 Summarize common networking attacks.		
DoS	Topic 8D	Topic 9A
Reflective	Topic 8D	Topic 9A
Amplified	Topic 8D	Topic 9A
Distributed	Topic 8D	Topic 9A
Social engineering	Topic 8D	Topic 11A
Insider threat	Topic 8D	Topic 11A
Logic bomb	Topic 8D	Topic 11A
Rogue access point	Topic 9D	Topic 13C
Evil twin	Topic 9D	Topic 13C
War driving	Topic 9D	Topic 13C
Phishing	Topic 8D	Topic 11A
Ransomware	Topic 8D	Topic 11A
DNS poisoning	Topic 8D	Topic 9A
ARP poisoning	Topic 8D	Topic 9A
Spoofing	Topic 8D	Topic 9A

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Deauthentication	Topic 8D	Topic 13C
Brute force	Topic 8D	Topic 11A
VLAN hopping	Topic 8D	Topic 9B
Man-in-the-middle	Topic 8D	Topic 9A
Exploits vs. vulnerabilities	Topic 8A	Topic 9A
4.5 Given a scenario, implement network device hardening.		
Changing default credentials	Topic 8B	Topic 11D
Avoiding common passwords	Topic 8B	Topic 11D
Upgrading firmware	Topic 9E	Topic 11E
Patches and updates	Topic 9E	Topic 11E
File hashing	Topic 9F	Topic 11D
Disabling unnecessary services	Topic 9C	Topic 11D
Using secure protocols	Topic 9C	Topic 11D
Generating new keys	Topic 9F	Topic 11D
Disabling unused ports	Topic 9C	Topic 11D
IP ports	Topic 9C	Topic 11D
Device ports (physical and virtual)	Topic 9C	Topic 11D
4.6 Explain common mitigation techniques and their purposes.		
Signature management	Topic 9F	Topic 10B
Device hardening	Topic 9E	Topic 11D
Change native VLAN	Topic 9F	Topic 9B
Switch port protection	Topic 9F	Topics 3B and 11C
Spanning tree	Topic 9F	Topic 3B
Flood guard	Topic 9F	Topic 11C
BPDU guard	Topic 9F	Topic 3B
Root guard	Topic 9F	Topic 3B
DHCP snooping	Topic 9F	Topic 11C
Network segmentation	Topic 9F	Topics 9B and 9C
DMZ	Topic 9F	Topic 9C
VLAN	Topic 9F	Topic 9B
Privileged user account	Topic 9F	Topic 11A
File integrity monitoring	Topic 9F	Topic 10B
Role separation	Topic 9F	Topic 11A
Restricting access via ACLs	Topic 9F	Topic 10A
Honeypot/honeynet	Topic 9F	Topic 11E
Penetration testing	Topic 9F	Topic 11E
Domain 5.0 Network Troubleshooting and Tools		

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5.1 Explain the network troubleshooting methodology.		
Identify the problem	Topic 14A	Topic 8B
Gather information	Topic 14A	Topic 8B
Duplicate the problem, if possible	Topic 14A	Topic 8B
Question users	Topic 14A	Topic 8B
Identify symptoms	Topic 14A	Topic 8B
Determine if anything has changed	Topic 14A	Topic 8B
Approach multiple problems individually	Topic 14A	Topic 8B
Establish a theory of probable cause	Topic 14A	Topic 8B
Question the obvious	Topic 14A	Topic 8B
Consider multiple approaches	Topic 14A	Topic 8B
Top-to-bottom/bottom-to-top OSI model	Topic 14A	Topic 8B
Divide and conquer	Topic 14A	Topic 8B
Test the theory to determine the cause	Topic 14A	Topic 8B
Once the theory is confirmed, determine the next steps to resolve the problem	Topic 14A	Topic 8B
If the theory is not confirmed, reestablish a new theory or escalate	Topic 14A	Topic 8B
Establish a plan of action to resolve the problem and identify potential effects	Topic 14A	Topic 8B
Implement the solution or escalate as necessary	Topic 14A	Topic 8B
Verify full system functionality and, if applicable, implement preventive measures	Topic 14A	Topic 8B
Document findings, actions, and outcomes	Topic 14A	Topic 8B
5.2 Given a scenario, use the appropriate tool.		
Hardware tools	Topic 14B	Topics 12B, 12C, 12D and 13B
Crimper	Topic 14B	Topic 12B
Cable tester	Topic 14B	Topic 12C
Punch down tool	Topic 14B	Topic 12B
OTDR	Topic 14B	Topic 12D
Light meter	Topic 14B	Topic 12D
Tone generator	Topic 14B	Topic 12C
Loopback adapter	Topic 14B	Topic 12C
Multimeter	Topic 14B	Topic 12C
Spectrum analyzer	Topic 14B	Topic 13B
Software tools	Topic 14B	Topics 2C, 4B, 5B, 6B, 6D, 10A and 14B
Packet sniffer	Topic 14B	Topic 2C

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Port scanner	Topic 14B	Topic 6B
Protocol analyzer	Topic 14B	Topic 6B
WiFi analyzer	Topic 14B	Topic 13B
Bandwidth speed tester	Topic 14B	Topic 14B
Command line	Topic 14B	Topics 2C, 4B, 5B, 6B, 6D, and 10A
ping	Topic 14B	Topic 4B
tracert, traceroute	Topic 14B	Topic 5B
nslookup	Topic 14B	Topic 6D
ipconfig	Topic 14B	Topic 4B
ifconfig	Topic 14B	Topic 4B
iptables	Topic 14B	Topic 10A
netstat	Topic 14B	Topic 6B
tcpdump	Topic 14B	Topic 2C
pathping	Topic 14B	Topic 5B
nmap	Topic 14B	Topic 6B
route	Topic 14B	Topic 5B
arp	Topic 14B	Topic 2C
dig	Topic 14B	Topic 6D
5.3 Given a scenario, troubleshoot common wired connectivity and performance issues		
Attenuation	Topic 14C	Topic 12C
Latency	Topic 14C	
Jitter	Topic 14C	
Crosstalk	Topic 14C	Topic 12C
EMI	Topic 14C	Topic 12C
Open/short	Topic 14C	Topic 12C
Incorrect pin-out	Topic 14C	Topic 12C
Incorrect cable type	Topic 14C	Topic 12C
Bad port	Topic 14C	Topic 12C
Transceiver mismatch	Topic 14C	Topic 12D
TX/RX reverse	Topic 14C	Topic 12C
Duplex/speed mismatch	Topic 14C	Topic 8C
Damaged cables	Topic 14C	Topic 12C
Bent pins	Topic 14C	Topic 12C
Bottlenecks	Topic 14C	
VLAN mismatch	Topic 14C	Topic 9B
Network connection LED status indicators	Topic 14C	Topic 12C

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5.4 Given a scenario, troubleshoot common wireless connectivity and performance issues.		
Reflection	Topic 14D	Topic 13B
Refraction	Topic 14D	Topic 13B
Absorption	Topic 14D	Topic 13B
Latency	Topic 14D	Topic 13B
Jittery	Topic 14D	Topic 13B
Attenuation	Topic 14D	Topic 13B
Incorrect antenna type	Topic 14D	Topic 13B
Interference	Topic 14D	Topic 13B
Incorrect antenna placement	Topic 14D	Topic 13B
Channel overlap	Topic 14D	Topic 13B
Overcapacity	Topic 14D	Topic 13B
Distance limitations	Topic 14D	Topic 13B
Frequency mismatch	Topic 14D	Topic 13B
Wrong SSID	Topic 14D	Topic 13C
Wrong passphrase	Topic 14D	Topic 13C
Security type mismatch	Topic 14D	Topic 13C
Power levels	Topic 14D	Topic 13B
Signal-to-noise ratio	Topic 14D	Topic 13B
5.5 Given a scenario, troubleshoot common network service issues.		
Names not resolving	Topic 14E	Topic 8C
Incorrect gateway	Topic 14E	Topic 8C
Incorrect netmask	Topic 14E	Topic 8C
Duplicate IP addresses	Topic 14E	Topic 8C
Duplicate MAC addresses	Topic 14E	Topic 8C
Expired IP address	Topic 14E	Topic 8C
Rogue DHCP server	Topic 14E	Topic 8C
Untrusted SSL certificate	Topic 14E	Topic 7A
Incorrect time	Topic 14E	Topic 7A
Exhausted DHCP scope	Topic 14E	Topic 8C
Blocked TCP/UDP ports	Topic 14E	Topic 10A
Incorrect host-based firewall settings	Topic 14E	Topic 10A
Incorrect ACL settings	Topic 14E	Topic 10A
Unresponsive service	Topic 14E	Topic 8C
Hardware failure	Topic 14E	Topic 8C

In Closing

This course is still designed for learners who have experience as IT professionals with experience in TCP/IP networking and Windows administration, and who want to gain additional knowledge of networking topics or use this course as the foundation for advanced networking certifications and career roles. To obtain CompTIA Network+ certification, learners will need to pass the N10-007 exam.

Enjoy the course!