CompTIA Network+ Cheat Sheet

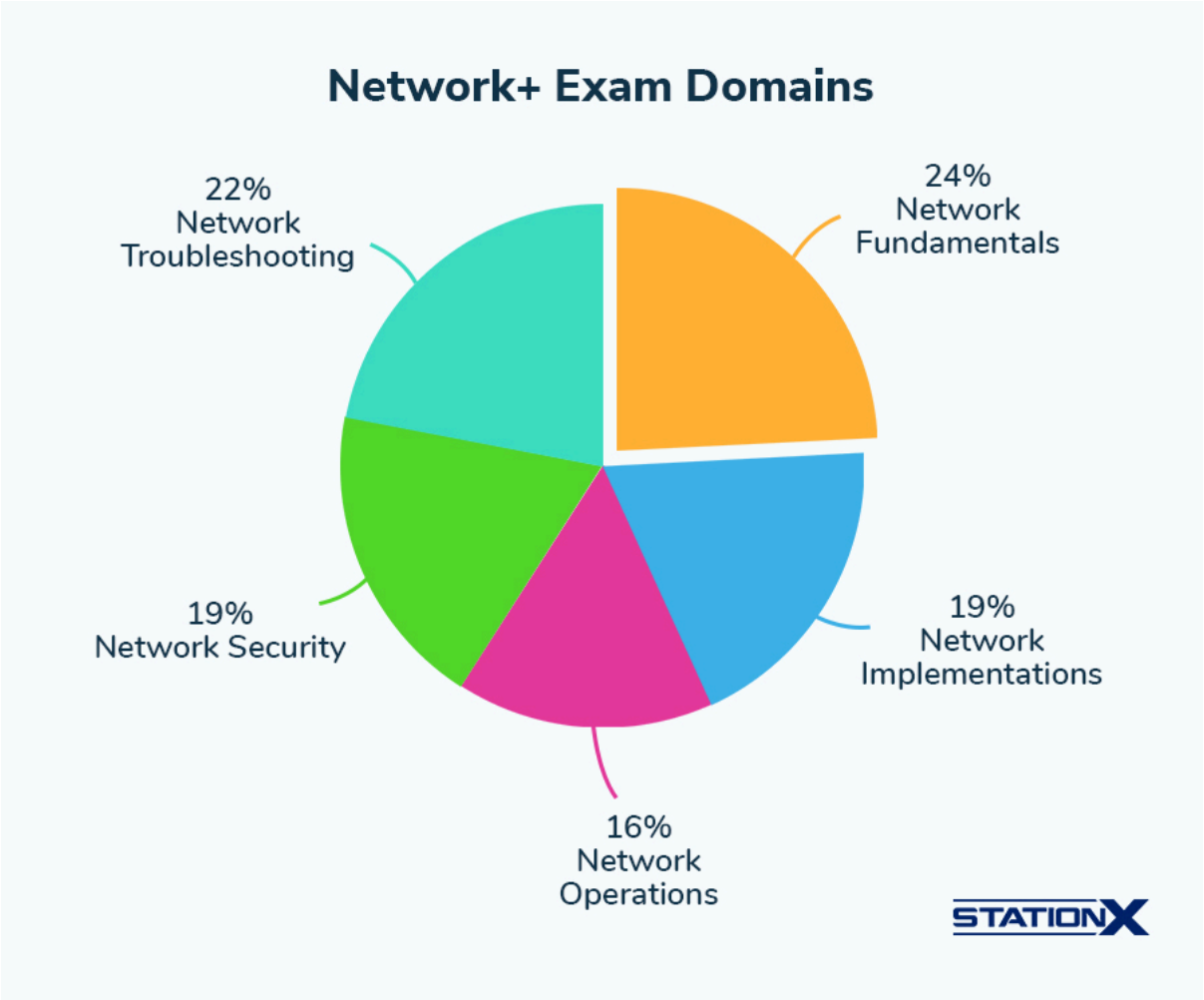
STATIONX
THE CYBER SECURITY COMPANY

About CompTIA Network+

The CompTIA Network+ exam tests your fundamental skills in essential computer networking functions.

You'll need to answer at most 90 questions in this 90-minute examination and complete a survey after it ends. The passing score is 720 on a scale of 100–900.

The latest CompTIA Security+ exam code is N10-008, available from September 2021 to sometime in 2024. The exam objectives (domains) are as follows:



CompTIA Network+ Exam Domains

Domains

This Net+ cheat sheet arranges concepts according to our Total Seminars Network+ course subtopics. Diagrams put concepts into a visual form and tables compartmentalize information. Here's a key to finding items by domain:

Hashtag (Remember to type the # symbol)	Domain (N10-008)
#nf	Networking Fundamentals
#ni	Network Implementations
#no	Network Operations
#ns	Network Security
#nt	Network Troubleshooting

Network Models

This section lays the foundation for all other Network+ sections.

Domain	Concept	Elaboration
#nf	OSI model	Open Systems Interconnect: 1. Physical 2. Data Link 3. Network 4. Transport 5. Session 6. Presentation 7. Application Memory aid: **Please Do Not Throw Sausage Pizza Away**
#nf	Unicast/Broadcast	One/All network devices receive data
#nf #ni	DHCP	Dynamic Host Configuration Protocol

Cabling and Topology

Be careful: it's easy to provide incorrect answers to exam questions related to the different fiber connector types.

Domain	Concept	Elaboration
#nf	Network topology	• Mesh • Star (hub-and-spoke) • Bus • Ring • Hybrid
#nf	TIA/EIA-568A	1. White/green 2. Green 3. White/orange 4. Blue 5. White/blue 6. Orange 7. White/brown 8. Brown
#nf	TIA/EIA-568B	Swap "green" and "orange" in TIA/EIA-568A
#nf	Coaxial	F-type, BNC
#nf	Twinaxial/twinax	Has two inner conductors instead of one as in coaxial
#nf	Twisted pair	RJ-45, RJ-11
#nf	STP/UTP	Shielded/Unshielded twisted pair

#nf	Fiber optic	SC, ST, LC, FC, MT-RJ
#nt	Plenum-rated	Fire-resistant cable; compare with riser-rated, non-plenum rated, and PVC
#nf	Multimode/Single-mode	Cables carry LED/laser signals
#nf	UTP category	Define speed and length of cables: • Cat 3 • Cat 5 • Cat 5e • Cat 6/6a • Cat 7 • Cat 8

Ethernet Basics

Recognizing the Ethernet naming syntax (10Base5, 100Base5, 1000Base5, 10Broad5, 10BaseT, etc.) is crucial to the Network+ exam.

Domain	Concept	Elaboration
#ni #nt	(Auto-)MDI-X	(Automatic) medium dependent interface crossover
#ni #nt	Uplink port	Enable connection between two switches using a straight-through cable
#ni #nt	CSMA/CD	Carrier sense multiple access with collision detection

Ethernet Standards

Familiarize yourself with 1000Base and 10GBase types (names, distances, node numbers, cable types, etc.).

Domain	Concept	Elaboration
#nf	1000BaseT	Maximum cable length: 100m; max speed: 1,000 Mbps (1 Gbps)
#nf	Half-duplex	For one-way communication
#nf	Full-duplex	For simultaneous two-way traffic
#nf	GBIC	Gigabit interface converter
#nf	SFP, SFP+	Small form-factor pluggable
#nf	QSFP	Quad small form-factor pluggable

#ni #nt	Switching/Bridging loop	Two or more data link layer paths between two endpoints
#ni #nt	Layer 2 attack	Attacks on OSI model layer 2 (data link)
#ni #nt	Flood guard	Block malicious traffic from entering a network

Installing a Physical Network

Remember the following concepts in structured cabling:

Domain	Concept	Elaboration
#nf	66-punchdown	Typically used in non-VoIP telephone systems
#nf	110-punchdown	For copper-wired networks
#nf	Fiber distribution panel	For fiber-optic networks
#nt	Wiremap	Simple test to confirm each wire terminates correctly
#nt	TDR	Time domain reflectometer
#nt	OTDR	Optical TDR
#nt	NEXT	Near-end crosstalk
#nt	FEXT	Far-end crosstalk
#nf #ns #no	MDF	Main distribution frame
#nf #ns #no	IDF	Intermediate distribution frame
#nf #ns	U (unit)	Standard height for rack components; 19-inch wide and a multiple of 1¾-inch tall
#nf #ns	Demarc	Separate the telecom company's property from your responsibility

TCP/IP Basics

Review additional information on IPv4 on your own.

Domain	Concept	Elaboration
#nf #ni	Internet Protocol (IP)	IPv4 and IPv6
#nf #ni	Transmission Control Protocol (TCP)	Connection-oriented

#nf #ni	User Datagram Protocol (UDP)	Connectionless
#nf #ni	IPv4 address	32-bit number, consisting of four decimals from 0 to 255 separated by period (.), e.g., 192.168.1.1
#nf #ni	IPv4 loopback	127.0.0.1
#nf #ni	APIPA/link-local	169.254.x.x
#nf #ni	Classless Inter-Domain Routing (CIDR)	CIDR IPv4 addresses have a prefix; e.g., "/24" in "10.150.23.58/24" denotes a 255.255.255.0 subnet mask.

Routing

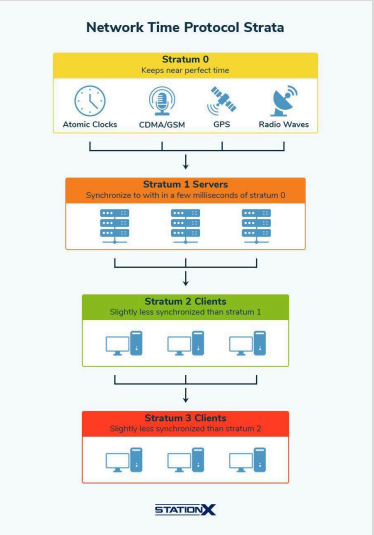
Review router-related abbreviations below.

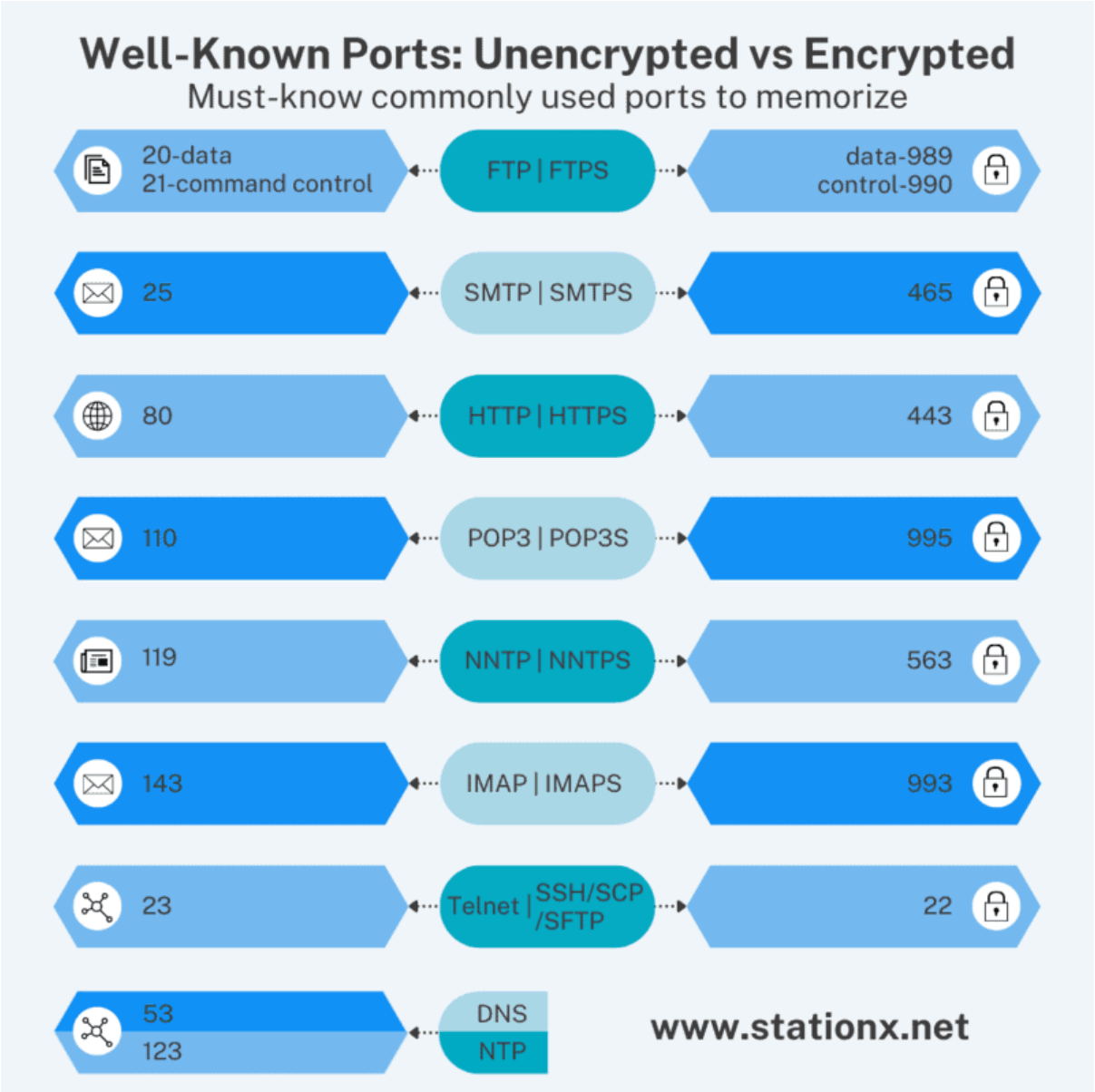
Domain	Concept	Elaboration
#nf #ni	BGP	Border Gateway Protocol
#ni	OSPF	Open Shortest Path First
#ni	RIP	Routing Information Protocol
#nf #ni	MTU	Maximum transmission unit
#nf #ni	IGP/EGP	Interior/Exterior Gateway Protocol
#nf	NAT	Network Address Translation
#nf	PAT	Port Address Translation

TCP/IP Applications

Remember to check out our Common Ports Cheat Sheet.

Domain	Concept	Elaboration
#nf	NTP	Network Time Protocol

		
#nf	SNTP	Simple Network Time Protocol
#nt	IGMP	Internet Group Management Protocol
#nf #nt	IPAM	IP Address Management
#nt	Networking troubleshooting tools	Windows: tracert Linux: • traceroute • ifconfig • pathping • netstat



Network Naming

Network administrators cannot skip this section.

Domain	Concept	Elaboration
#nf	DNS	Domain Name System
#nf	SOA	Start of authority
#nf	A/AAAA	DNS record for IPv4/IPv6
#nf	CNAME	Canonical name or alias
#nf	MX	Mail exchange
#nf	PTR	Pointer record

Securing TCP/IP

Review key network security acronyms here.

Domain	Concept	Elaboration
#ns	RADIUS	For authentication, authorization, and accounting
#ns	TACACS+	For access control
#ns	Kerberos	For authentication and authorization on wired networks
#ns	EAP	Extensible Authentication Protocol
#ns	PEAP	Protected Extensible Authentication Protocol
#nt	PKI	Public Key Infrastructure
#ns	SAML	Security Assertion Markup Language

Switch Features

The definition for VLAN (virtual local area network) is in the section Integrating Networked Devices.

Domain	Concept	Elaboration
#ni	VTP	VLAN Trunking Protocol
#ni #ns #nt	STP	Spanning Tree Protocol
#ni #ns #nt	BPDU	Bridge protocol data unit
#ni #no	LACP	Link Aggregation Control Protocol
#ni	QoS	Quality of service
#ni	IDS	Intrusion detection system
#ni	IPS	Intrusion prevention system

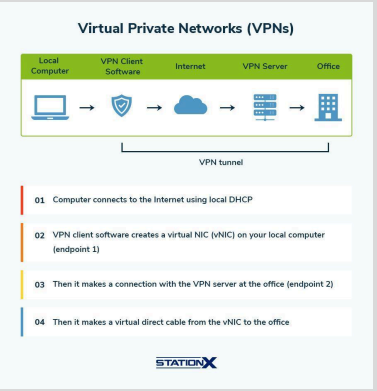
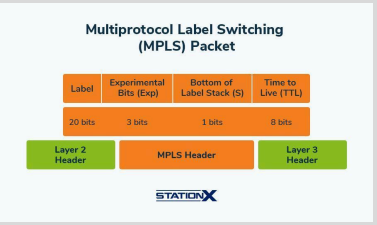
IPv6

Here are IPv6 concepts for quick learning:

Domain	Concept	Elaboration
#nf #ni	NDP	Neighbor Discovery Protocol
#nf #ni	IPv6 address	128-bit hexadecimal number, e.g., 2001:7120:0000:8001:0000:0000:0000:1F10
#nf #ni	IPv6 loopback	::1 (unicast)
#nf	VLSM	Variable-length subnet mask

WAN Connectivity

Review additional information on WAN construction by yourself.

Domain	Concept	Elaboration
#nf #ns	VPN	Virtual Private Network 
#nf	WDM/BWDM	Bidirectional wavelength division multiplexing
#nf	DWDM	Dense wavelength division multiplexing
#nf	MPLS	Multiprotocol Label Switching 
#ni	GSM	Global System for Mobile Communications
#ni	TDMA	Time-division multiple access
#ni	EDGE	Enhanced Data rates for GSM Evolution
#ni	CDMA	Code-division multiple access
#nf #ns	ICA	Independent Computing Architecture (Citrix)
#nf #ns	TightVNC	Tight Virtual Network Computing
#nf #ns	RDP	Microsoft Remote Desktop Protocol
#nf #ns	PPTP	Point-to-Point Tunneling Protocol
#nf #ns	L2TP/IPsec	Layer 2 Tunneling Protocol over IPsec
#nf #ns	EAP	Encapsulating Security Payload

#nf #ns	GRE	Generic Routing Encapsulation

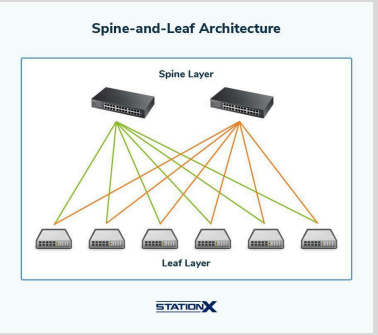
Wireless Networking

The ubiquity of mobile devices makes mastering wireless networking a necessity.

Domain	Concept	Elaboration
#ni	SSID	Service Set Identifier
#ni	BSSID/ESSID	Basic/Extended Service Set Identifier
#ni	CSMA/CA	Carrier-sense multiple access with collision avoidance
#ni	DSSS	Direct-sequence spread-spectrum
#ni	OFDM	Orthogonal frequency-driven multiplexing
#ni	Wireless Ethernet versions	• 802.11a • 802.11b • 802.11g • (802.11i) • 802.11n • 802.11ac • 802.11ax
#ni	PoE	Power over Ethernet • PoE injector • PoE+ 802.3af. 15.4 watts • PoE+ 802.3at, 30 watts
#ni #nt	Wireless antennae	• Omni • Dipole • Patch • Directional/Yagi • Directional/Parabolic • SMA (SubMiniature version A) connector Gain measured in dBi
#ni	WPA2	Wi-Fi Protected Access version 2, encryption: CCMP-AES
#nt	APIPA	Automatic Private IP Addressing
#ns	Evil twin	Fake Wi-Fi access point to trick people into choosing it over the genuine one

Virtualization and Cloud Computing

This section covers virtual machines and key ideas in cloud computing.

Domain	Concept	Elaboration
#nf	Cloud	Considerations: • Scalability • Elasticity • Multitenancy • Security implications • Principle of least privilege Types: • Public • Private • Community • Hybrid
#nf	Hypervisor Type 1	Bare or native metal
#nf	Hypervisor Type 2	App-like VM on the operating system
#nf	IaaS	Infrastructure as a Service
#nf	PaaS	Platform as a Service
#nf	SaaS	Software as a Service
#nf	DaaS	Desktop as a Service
#nf	VDI	Virtual desktop infrastructure
#nf	IaC	Infrastructure as Code
#nf	vSwitch	Virtual switch
#nf	VPC	Virtual private cloud
#nf	NFV	Network function virtualization
#nf	SDN	Software-defined networking 

Data Centers

The prevalence of cloud computing makes learning about data centers a necessity.

Domain	Concept	Elaboration
#nf	FCoE	Fibre Channel over Ethernet
#nf	FC	Fibre Channel
#nf	HBA	Host bus adaptor
#no	FHRP	First Hop Redundancy Protocol
#no	VRRP	Virtual Router Redundancy Protocol
#no	HSRP	Hot Standby Router Protocol
#no	UPS	Uninterruptible power supply
#no	HVAC	Heating, ventilation, and air conditioning
#no	PDU	Power distribution unit

Integrating Networked Devices

Know the differences between every type of “area network.”

Domain	Concept	Elaboration
#ni #ns	IoT	Internet of Things
#nf #ni	VoIP	Voice over IP
#ni	ICS	Industrial control systems
#ni	SCADA	Supervisory control and data acquisition system
#nf #ni	LAN	Local area network
#nf	WLAN	Wireless local area network
#ni	VLAN	Virtual LAN; split one broadcast domain into two
#nf	CAN	Campus area network
#nf	WAN	Wide area network
#nf	SD-WAN	Software-defined wide area network
#nf	MAN	Metropolitan area network
#nf	PAN	Personal area network
#nf	SAN	Storage area network

Network Operations

Network operations cover the actions needed to protect a network and its associated organization. Two main risks are security and business.

Domain	Concept	Elaboration
#no #ns	NDA	Nondisclosure Agreement
#no #ns	MOU	Memorandum of Understanding
#no #ns #nf	MSA	Multi-Source Agreement

#no #ns	SLA	Service Level Agreement
#no #ns	BYOD	Bring Your Own Device
#no #ns	SOW	Statement of Work
#ns	Incident response	• Forensics • First responder • Secure the area • Document the scene • Collect evidence • Chain of custody • Forensics report • Legal hold • Electronic discovery (e-discovery)
#no	RPO	Recovery point objective
#no	RTO	Recovery time objective
#no	MTTR	Mean time to repair
#no	MTTF	Mean time to failure
#no	MTBF	Mean time between failures
#no	BCP	Business continuity plan
#no #nt	AUP	Acceptable use policy
#no #nt	MDM	Mobile Device Manager
#no #nt	COBO	Corporate-owned, business only
#no #nt	COPE	Corporate-owned, personally enabled
#no #nt	CYOD	Choose your own device

Protecting Networks

This is a vital section, especially if you intend to embark on a career in cyber security.

Domain	Concept	Elaboration
#ns	CIA triad	Confidentiality, integrity, availability
#ns	Honeypot/honeynet	Individual/connected devices inviting attacks to capture information
#ns #nt	Rogue DHCP server	IP address is outside of the network ID
#ns	Screened subnet (demilitarized zone, DMZ)	Five components: • External network • External router • Perimeter network • Internal router • Internal network
#ni #ns #nt	Man-in-the-middle (MITM)/on-path attack	Intercept a two-party conversation for one's advantage Tools: • Ettercap

		• Wireshark • tcpdump
#ns	Spoofing	Digital misrepresentation • MAC • IP • VLAN
#ni #ns	DTP	Cisco Dynamic Trunking Protocol
#ns	ITAD	IT asset disposal
#ns	DNS poisoning	Exploit known DNS vulnerabilities
#ns	URL hijacking/typosquatting	Target URL typos
#ns	Replay attack	Intercept data and replay later
#ns	Downgrade attack	Force a network channel to switch to an unprotected or less secure data transmission standard
#ns	Session hijacking	Seize control of a user's browsing session to gain access
#no #ns	Brute-force attack	Trying character combinations
#no #ns	Dictionary attack	Using lists of probable passwords
#ni #ns	VLAN hopping	Attacker can move from one VLAN to another
#ns	CVE	Common vulnerabilities and exposure: publicly disclosed list of security flaws
#ns	CNA	CVE Numbering Authority
#ns	Zero-day	Flaw discovered by third party sooner than vendor
#ni #ns	DAI	Cisco Dynamic ARP Inspection
#ni #ns	RA	Router Advertisement
#ni #ns	Control plane policing	Use QoS to stop Denial-of-Service attacks
#ni #nt #ns	Firewall	Filter for network traffic - Hardware/software - Stateful/stateless - Network-based/host-based - Context-/application-aware
#ni #nt	UTM	Unified threat management
#ni	ACL	Access control list
#ni	DPI	Deep-packet inspection
#ns	Virus	Run on a computer without the user's knowledge. Examples: Boot Sector, Macro, Program,

		Polymorphic, Stealth, and Multipartite.
#ns	Worm	Replicate itself across a network
#ns	Trojan Horse	Perform useful functions superficially but runs malicious programs covertly
#ns	Spyware	Spy on a computer and record its activities. Examples: keylogger and browser-hijacking adware
#ns	Rootkit	Gain administrator-level access to the system core undetected
#ns	Ransomware	Hold a computer hostage until the user pays
#ns	Adware	Unwanted software displaying advertisements
#ns	Remote Access Trojans (RATs)	Malware to remotely control an infected computer
#ns	Logic bomb	Start a malicious program upon fulfillment of certain logical conditions
#ns	Crypto-malware	Mine cryptocurrency that enriches perpetrators
#ns	Physical controls	● Deterrent: ○ Preventative ○ Detective ○ Corrective ● Recovery ● Compensating controls

Network Monitoring

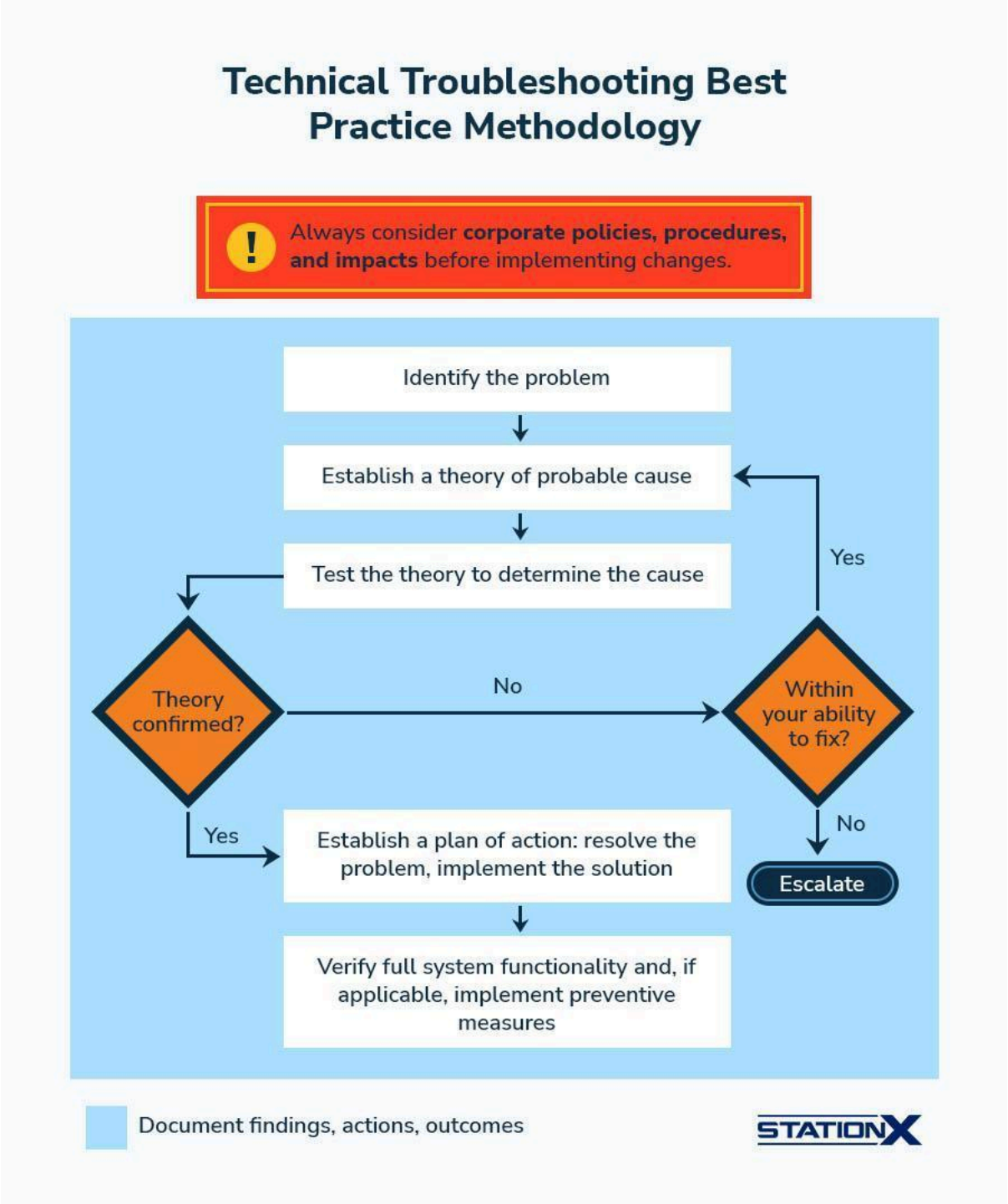
Monitoring a network helps nip problems in the bud.

Domain	Concept	Elaboration
#ns	SIEM	Security Information and Event Management
#nf #no #ns	SNMP	Simple Network Management Protocol
#nf #no #ns	NMS	Network management system/station
#no	Event Viewer, Syslog	Tools to display logs

Network Troubleshooting

Apply the six technical troubleshooting steps (same as A+) to networking problems.

Domain	Concept	Elaboration
#nt	Additional considerations on the “establish theory” step	- Top-to-bottom/bottom-to-top - OSI model - Divide and conquer



Technical Troubleshooting Best Practice Methodology (borrowed from our A+ Cheat Sheet)

Conclusion

We hope this quick review Network+ cheat sheet helps your learning or career journey. Check out our other articles on networking, strictly exam-related test taking tips, and Network+ accelerated certification training programs, which include supplemental sample tests and chapter-end test questions. No matter where you go next, we wish you all the best.