

Name: _____

Date: _____

Score: _____

ExpressVPN Security

Evaluating ExpressVPN's security infrastructure, the custom open-source Lightway protocol, RAM-only TrustedServer technology, independent security audits, and Network Lock kill switch.

EXPRESSVPN SECURITY LEARNING OVERVIEW

LEARNER

STUDENT STATUS

Network Defender Track

SECURE

CONNECTION STATUS

Shielding data packets

100%

LEAK DEFENSE

DNS & IPv6 leak protection

Welcome! This activity packet guides you through ExpressVPN's security features. You will explore open-source protocols, RAM-only server nodes, ciphers, and the Network Lock kill switch.

WORKSHEET CHECKPOINTS

- ☐ **Part 1-4:** Master VPN and network security configurations.
- ☐ **Part 5-7:** Solve crossword & word search puzzles.
- ☐ **Part 8-9:** Solve case studies & cipher challenge.
- ☐ **Part 10:** Review basic & advanced FAQ pages.
- ☐ **Part 11:** Explore 10 interesting real-world facts.

Open the VPN.com Best VPNs Guide

URL: <https://www.vpn.com/vpn/expressvpn-security/>

Your ExpressVPN Security Learning Roadmap

- Analyze the technical architecture and configuration rules of ExpressVPN Security.
- Configure client settings to prevent IP, DNS, and WebRTC traffic leaks.
- Compare custom pricing, trial, and performance features against standard models.

EXPRESSVPN SECURITY GUIDE INSTRUCTIONS

Answer the multiple choice and true/false questions, complete the fill-in-the-blank sentences using the word bank, match definitions, and solve the crossword and word search puzzles. Apply your knowledge to open-source protocols and RAM-only server nodes.

RAM-ONLY SERVER ARRAYS & OPEN-SOURCE CONNECTION PROTOCOLS (INTRODUCTION)

ExpressVPN employs RAM-only TrustedServer technology to prevent local logs, combined with its custom open-source Lightway protocol and a Network Lock kill switch to provide end-to-end user data security.

READ EACH CHECKPOINT CAREFULLY AND SELECT OR WRITE THE CORRECT RESPONSE.

Checkpoint 1: Multiple Choice Challenge

1 What is ExpressVPN's custom open-source protocol?

- ☐ A) Lightway
- ☐ B) WireGuard
- ☐ C) OpenVPN
- ☐ D) Chameleon

2 What server technology runs exclusively in volatile RAM?

- ☐ A) TrustedServer
- ☐ B) RAM-Core
- ☐ C) SecureRAM
- ☐ D) NoSpy Server

3 What happens if a VPN connection unexpectedly drops?

- ☐ A) Network Lock blocks traffic
- ☐ B) Traffic leaks to ISP
- ☐ C) System reboots
- ☐ D) Data gets unencrypted

4 Where is ExpressVPN incorporated to protect privacy?

- ☐ A) British Virgin Islands
- ☐ B) Switzerland
- ☐ C) Panama
- ☐ D) Romania

5 Which symmetric encryption cipher is used by default?

- ☐ A) AES-256-GCM
- ☐ B) Blowfish
- ☐ C) DES-64
- ☐ D) ChaCha20

Checkpoint 2: True or False Challenge

6 Question 6

TrustedServer technology stores server logs on hard drives.

☐

True

☐

False

7 Question 7

ExpressVPN has undergone third-party security audits.

☐

True

☐

False

8 Question 8

Lightway protocol is built on top of OpenVPN codebase.

☐

True

☐

False

9 Question 9

The Network Lock kill switch is enabled by default.

☐

True

☐

False

10 Question 10

ExpressVPN operates private DNS on every single server.

☐

True

☐

False

Checkpoint 3: Key Term Insertion

Read each sentence below and fill in the blank with the correct term from the Word Bank.

1. The proprietary, high-speed protocol designed by ExpressVPN is _____.
2. To prevent data retention, the server network relies on _____ RAM-only nodes.
3. The native kill switch on ExpressVPN is called Network _____.
4. ExpressVPN is registered under the laws of the British Virgin _____.
5. Data payloads are secured using the robust symmetric cipher _____.
6. The zero-logs policy has been verified and independently _____ by top firms.

VOCABULARY WORD BANK

lightway
aes-256

trustedserver
audited

lock
leak

islands
dns

Write your answers here:

- | | | | |
|----|----------------------|----|----------------------|
| 1. | <input type="text"/> | 2. | <input type="text"/> |
| 3. | <input type="text"/> | 4. | <input type="text"/> |
| 5. | <input type="text"/> | 6. | <input type="text"/> |

Checkpoint 4: VPN & Network Concept Match

DEFINITION MATCHING

Match each vocabulary term on the left with its correct definition on the right by writing the corresponding letter (A-H) in the fillable input box.

lightway

B RAM-only server architecture preventing data storage on disk

trustedserver

A ExpressVPN's lightweight, open-source connection protocol

lock

F Independently verified by third-party security firms

islands

G Unintended exposure of private IP, DNS, or WebRTC data

aes-256

D The British Virgin Islands jurisdiction offering strong privacy

audited

H Domain Name System resolvers run privately on every server node

leak

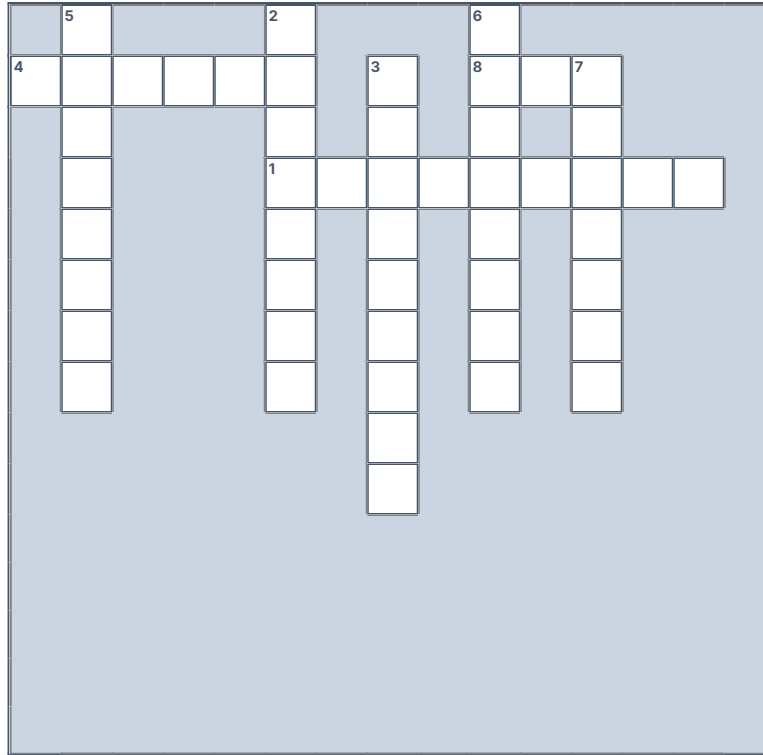
C The Network Lock system that blocks traffic if the VPN drops

dns

E Symmetric encryption standard securing data transmission

Checkpoint 5: Crossword Puzzle

Solve the crossword puzzle by typing letters into the active white boxes. The numbers correspond to the clues below.



ACROSS

1. Process of wrapping data packets inside other packets (9)
4. Remote server that routes traffic and hides your IP (6)
8. Internet Service Provider, logs traffic unless encrypted (3)

DOWN

2. Rules determining how data is sent and encrypted (8)
3. Rate of data transfer across a path (9)
5. Blocking site access based on location (8)
6. Security system that monitors and blocks traffic (8)
7. State of being free from tracking or surveillance (7)

Checkpoint 5 Alternative: Accessible Crossword Clues

Screen-reader and keyboard users can type the crossword answers directly in the text fields below.

ACROSS CLUES

1 Across: Lightweight, open-source connection protocol. (8 letters):

4 Across: RAM-only server architecture preventing disk storage. (13 letters):

5 Across: System that blocks traffic if the VPN drops. (4 letters):

7 Across: Third-party verified by independent security firms. (7 letters):

DOWN CLUES

2 Down: British Virgin Islands jurisdiction for privacy. (7 letters):

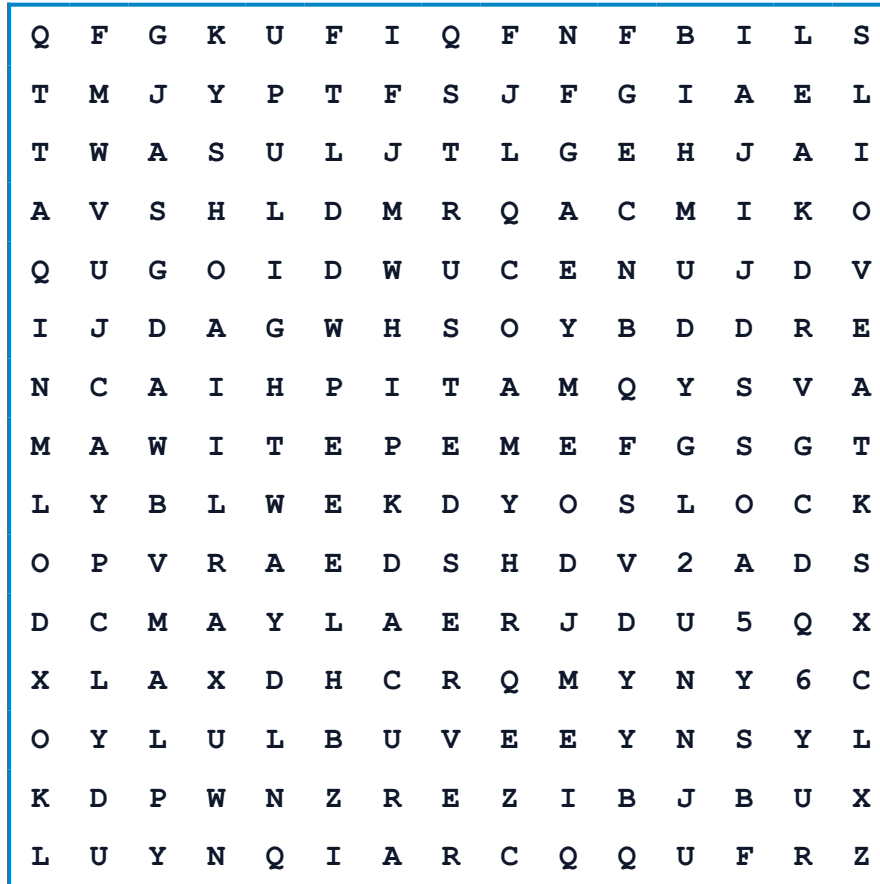
3 Down: Symmetric encryption standard for data. (7 letters):

6 Down: Unintended exposure of private IP or DNS data. (4 letters):

8 Down: Resolvers run privately on every server node. (3 letters):

Checkpoint 6: Hidden Word Search

Find the 8 key vocabulary terms hidden in the grid below. Words can be horizontal, vertical, or diagonal.



VOCABULARY WORD LIST

lightway
aes-256

trustedserver
audited

lock
leak

islands
dns

Checkpoint 6 Alternative: Accessible Vocabulary Matching

Match each of the 8 vocabulary terms from the Word Search to its correct definition by writing the letter (A-H) in the blank space.

VOCABULARY TERMS

- A. lightway
- B. trustedserver
- C. lock
- D. islands
- E. aes-256
- F. audited
- G. leak
- H. dns

DEFINITIONS & MATCH FIELDS

- 1. ExpressVPN's lightweight, open-source connection protocol.
- 2. RAM-only server architecture preventing data storage on disk.
- 3. The Network Lock system that blocks traffic if the VPN drops.
- 4. The British Virgin Islands jurisdiction offering strong privacy.
- 5. Symmetric encryption standard securing data transmission.
- 6. Independently verified by third-party security firms.
- 7. Unintended exposure of private IP, DNS, or WebRTC data.
- 8. Domain Name System resolvers run privately on every server node.

Checkpoint 7: Scrambled Word Challenge

Unscramble the letters below to reveal key Virtual Private Network (VPN) concepts and terms. Write your answers in the input boxes provided.

1. IGHWTAYL

5. OUTINGR

2. ECURITYS

6. UDITEDA

3. IPHERSC

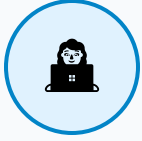
7. WITCHS

4. SLANDSI

8. ECRETSS

Checkpoint 8: VPN & Network Case Studies

Apply the concepts you have learned to solve the real-world scenarios below.



CASE STUDY 1: ENFORCING RAM-ONLY PROTECTIONS

Scenario: A government agency seizes an ExpressVPN server to extract user logs and connection history.

Discussion Question: What information will they find on the server, and why?



CASE STUDY 2: UNSTABLE WI-FI CONNECTION TUNNELS

Scenario: A remote worker is using public hotel Wi-Fi that drops every few minutes while editing documents.

Discussion Question: How does ExpressVPN protect their data from leaking during drops?

Final Challenge: Decrypting the Cipher

A network engineer secures routing channels and client tunnels. Use the Letter-to-Number key below to decrypt the message by writing the matching letters in the blank spaces.

LETTER-TO-NUMBER ENCRYPTION KEY

A=1	B=2	C=3	D=4	E=5	F=6	G=7	H=8	I=9	J=10	K=11	L=12	M=13
N=14	O=15	P=16	Q=17	R=18	S=19	T=20	U=21	V=22	W=23	X=24	Y=25	Z=26

Decoded cybersecurity message:

TIP: EACH NUMBER REPRESENTS THE POSITION OF THAT LETTER IN THE ALPHABET (E.G. 1 = A, 2 = B, 26 = Z).

Checkpoint 10: Basic VPN FAQs (Part A)

Review the most common questions and answers regarding Virtual Private Networks (VPNs) and tunneling.

Q1: What encryption does ExpressVPN use?

ExpressVPN uses AES-256-GCM symmetric encryption by default.

Q2: What is the Lightway protocol?

Lightway is ExpressVPN's custom protocol built for speed, security, and stability.

Q3: Does ExpressVPN log my search history?

No, ExpressVPN enforces a strict, independently audited zero-logs policy.

Q4: What is the Network Lock?

It is ExpressVPN's native kill switch that blocks internet traffic if the connection drops.

Q5: Is the Lightway protocol open-source?

Yes, the core code of the Lightway protocol is open-source and on GitHub.

Checkpoint 10: Basic VPN FAQs (Part B)

Review the most common questions and answers regarding Virtual Private Networks (VPNs) and tunneling.

Q6: Does ExpressVPN run private DNS?

Yes, ExpressVPN operates its own private, encrypted DNS on every server.

Q7: What is TrustedServer technology?

It is a server setup where the OS and apps run entirely in volatile RAM memory.

Q8: Has ExpressVPN been audited?

Yes, ExpressVPN has been audited by firms like PwC, Cure53, and F-Secure.

Q9: Does ExpressVPN protect against WebRTC leaks?

Yes, the apps have built-in leak protection for WebRTC, IPv6, and DNS.

Q10: Where is ExpressVPN located?

ExpressVPN is incorporated in the British Virgin Islands (BVI).

Checkpoint 11: Advanced VPN FAQs (Part A)

Explore advanced technical aspects of VPN tunneling protocols, mobile client integrations, and enterprise deployment.

Q1: How does RAM-only architecture enhance security?

It ensures that no data is written to hard drives, making data extraction impossible on power loss.

Q2: What makes the BVI jurisdiction safe for privacy?

The BVI has no data retention laws and falls outside major intelligence sharing agreements.

Q3: Does ExpressVPN support perfect forward secrecy?

Yes, it negotiates new keys at startup and every 60 minutes via ECDHE.

Q4: How does Network Lock prevent IP leaks?

It blocks all network traffic at the firewall level when a drop is detected.

Q5: What hashing algorithm is used for authentication?

ExpressVPN uses HMAC SHA-512 for data integrity authentication.

Checkpoint 11: Advanced VPN FAQs (Part B)

Explore advanced technical aspects of VPN tunneling protocols, mobile client integrations, and enterprise deployment.

Q6: Can government agencies intercept Lightway traffic?

They can intercept it, but they cannot decrypt it due to AES-256/ChaCha20 encryption.

Q7: How does private DNS protect user search logs?

It processes all DNS queries inside the encrypted tunnel, preventing ISP monitoring.

Q8: Does ExpressVPN support double VPN hops?

ExpressVPN does not offer native multi-hop, focusing on single-hop speed and security.

Q9: What is the advantage of Lightway over WireGuard?

Lightway is custom-built to handle network transitions (like Wi-Fi to mobile) instantly without dropping.

Q10: How often is the server software re-installed?

With TrustedServer, the entire software stack is reloaded from a secure read-only image on every reboot.

Part 11: 10 Real-World VPN Facts & Insights

Review real-world facts regarding VPN encryption speeds, protocol audits, mobile connectivity, and enterprise remote work.

1. VPN INSIGHT

ExpressVPN uses AES-256-GCM encryption with 4096-bit RSA keys.

2. VPN INSIGHT

TrustedServer technology ensures all server operations run exclusively in RAM.

3. VPN INSIGHT

The British Virgin Islands (BVI) serves as the corporate jurisdiction.

4. VPN INSIGHT

Lightway protocol features a codebase of only about 2,000 lines of code.

5. VPN INSIGHT

The Network Lock kill switch blocks traffic at the system firewall level.

6. VPN INSIGHT

All DNS queries are resolved through private, encrypted DNS servers.

7. VPN INSIGHT

ExpressVPN has undergone over a dozen independent third-party audits.

8. VPN INSIGHT

The service does not log IP addresses, browsing history, or traffic metadata.

9. VPN INSIGHT

Perfect Forward Secrecy is maintained using dynamic session key rotation.

10. VPN INSIGHT

The Lightway protocol supports both UDP and TCP transport layers.

Technical References & Sources

The study guide and interactive puzzles are compiled from global technical standards, specifications, and regulatory frameworks.

SCHOLARLY & INDUSTRY REFERENCES

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Answer Key: Checkpoint 1 - Multiple Choice

1 Network Check 1

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

What is ExpressVPN's custom open-source protocol?

Citation: IETF VPN RFC [Ref 3].

2 Network Check 2

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

What server technology runs exclusively in volatile RAM?

Citation: IETF VPN RFC [Ref 3].

3 Network Check 3

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

What happens if a VPN connection unexpectedly drops?

Citation: IETF VPN RFC [Ref 3].

4 Network Check 4

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

Where is ExpressVPN incorporated to protect privacy?

Citation: IETF VPN RFC [Ref 3].

5 Network Check 5

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

Which symmetric encryption cipher is used by default?

Citation: IETF VPN RFC [Ref 3].

Answer Key: Checkpoint 2 - True or False

6 Network Rule 1

VPN PROTECTION

Correct Answer: False

TEACHING NOTE

TrustedServer technology stores server logs on hard drives.

Citation: IETF VPN RFC [Ref 3].

7 Network Rule 2

VPN PROTECTION

Correct Answer: True

TEACHING NOTE

ExpressVPN has undergone third-party security audits.

Citation: IETF VPN RFC [Ref 3].

8 Network Rule 3

VPN PROTECTION

Correct Answer: False

TEACHING NOTE

Lightway protocol is built on top of OpenVPN codebase.

Citation: IETF VPN RFC [Ref 3].

9 Network Rule 4

VPN PROTECTION

Correct Answer: True

TEACHING NOTE

The Network Lock kill switch is enabled by default.

Citation: IETF VPN RFC [Ref 3].

10 Network Rule 5

VPN PROTECTION

Correct Answer: True

TEACHING NOTE

ExpressVPN operates private DNS on every single server.

Citation: IETF VPN RFC [Ref 3].

Vocabulary Keys & Grading Rubric

Instructor Grading Rubric: Award 1 point for each correct matching (8 points total) and context term (6 points total).

CHECKPOINT 4: CONCEPT MATCH KEY

A lightway

B trustedserver

C lock

D islands

E aes-256

F audited

G leak

H dns

CHECKPOINT 3: KEY TERM KEY

1 lightway

2 trustedserver

3 lock

4 islands

5 aes-256

6 audited

DISCUSSION NOTES FOR INSTRUCTORS

Valuation Accuracy:

Verify that students understand how domain length, extension (.com, .ai), and commercial search volume drive appraisal pricing.

Escrow Security:

Emphasize that funds are held in licensed third-party holding accounts prior to domain WHOIS transfer verification.

Stealth Representation:

Highlight the role of NDAs and third-party representation in preventing speculative price gouging during corporate procurement.

Puzzles Keys & Instructor Notes

WORD SEARCH SOLUTION

Q	F	G	K	U	F	I	Q	F	N	F	B	I	L	S
T	M	J	Y	P	T	F	S	J	F	G	I	A	E	L
T	W	A	S	U	L	J	T	L	G	E	H	J	A	I
A	V	S	H	L	D	M	R	Q	A	C	M	I	K	O
Q	U	G	O	I	D	W	U	C	E	N	U	J	D	V
I	J	D	A	G	W	H	S	O	Y	B	D	D	R	E
N	C	A	I	H	P	I	T	A	M	Q	Y	S	V	A
M	A	W	I	T	E	P	E	M	E	F	G	S	G	T
L	Y	B	L	W	E	K	D	Y	O	S	L	O	C	K
O	P	V	R	A	E	D	S	H	D	V	2	A	D	S
D	C	M	A	Y	L	A	E	R	J	D	U	5	Q	X
X	L	A	X	D	H	C	R	Q	M	Y	N	Y	6	C
O	Y	L	U	L	B	U	V	E	E	Y	N	S	Y	L
K	D	P	W	N	Z	R	E	Z	I	B	J	B	U	X
L	U	Y	N	Q	I	A	R	C	Q	Q	U	F	R	Z

CROSSWORD SOLUTION

	5	G				2	P			6	F			
4	S	E	R	V	E	R		3	B	8	I	S	7	P
	O					O		A		R		R		
	B					1	T	U	N	N	E	L	I	N
	L					O		D		W		V		
	O					C		W		A		A		
	C					O		I		L		C		
	K					L		D		L		Y		
								T						
								H						

INSTRUCTOR GUIDE FOR CROSSWORD SOLUTIONS

ACROSS CLUES

- 1 Across:** **TUNNELING** Process of wrapping data packets. (3, 5)
- 4 Across:** **SERVER** Remote computer routing traffic. (1, 0)
- 8 Across:** **ISP** Internet Service Provider. (1, 9)

DOWN CLUES

- 2 Down:** **PROTOCOL** Rules determining data transmission. (0, 5)
- 3 Down:** **BANDWIDTH** Rate of data transfer. (1, 7)
- 5 Down:** **GEOBLOCK** Location website restriction. (0, 1)
- 6 Down:** **FIREWALL** Security monitor barrier. (0, 9)
- 7 Down:** **PRIVACY** State of freedom from tracking. (1, 11)

Scrambled Words & Cipher Solution Key

Grading key for the vocabulary word unscramble activity and Secret Cipher Challenge.

WORD UNSCRAMBLE KEY

1. IGHWAYL

LIGHTWAY

5. OUTINGR

ROUTING

2. ECURITYS

SECURITY

6. UDITEDA

AUDITED

3. IPHERSC

CIPHERS

7. WITCHS

SWITCH

4. SLANDSI

ISLANDS

8. ECRETSS

SECRETS

SECRET CIPHER CHALLENGE KEY

**"TRUSTEDSERVER TECHNOLOGY WIPES ALL USER LOGS
DAILY"**

VPN & Network Case Studies Solution Key

A Case Study 1: Enforcing RAM-Only Protection

[Instructor Solution](#)

GRADING GUIDELINE

Student answers should cover the following points:

- **Scenario Analysis:** A government agency seizes an ExpressVPN server to extract user logs and connection history.
- **Recommended Strategy & Solution:** Nothing. ExpressVPN's TrustedServer technology runs entirely in RAM, so all data is wiped instantly upon power loss.

B Case Study 2: Unstable Wi-Fi Connection Tunnel

[Instructor Solution](#)

GRADING GUIDELINE

Student answers should cover the following points:

- **Scenario Analysis:** A remote worker is using public hotel Wi-Fi that drops every few minutes while editing documents.
- **Recommended Strategy & Solution:** The Network Lock kill switch automatically blocks all internet traffic until the VPN tunnel is re-established.