

Name: _____

Date: _____

Score: _____

Mullvad Speed Test

Evaluating Mullvad VPN connection performance including throughput benchmarking, SOCKS5 proxy optimization, WireGuard vs OpenVPN speed comparisons, and latency reduction techniques.

MULLVAD SPEED TEST 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 Mullvad's speed performance. You will explore kernel-space WireGuard throughput, dedicated server port upgrades, and split tunneling latency controls.

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/mullvad-speed-test/>

Your Mullvad Speed Learning Roadmap

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

MULLVAD SPEED 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 throughput optimization and latency controls.

EVALUATING THROUGHPUT PERFORMANCE & ROUTING LATENCY (INTRODUCTION)

Mullvad delivers high-performance data transfers by running WireGuard natively in operating system kernels. They deploy dedicated high-speed server ports, support custom MTU size configurations, and omit bandwidth limits globally.

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

Checkpoint 1: Multiple Choice Challenge

1 Which protocol offers the highest download throughput in Mullvad?

- ☐ A) OpenVPN TCP
- ☐ B) OpenVPN UDP
- ☐ C) WireGuard
- ☐ D) SOCKS5 Proxy

2 What is the primary factor limiting VPN speed over long distances?

- ☐ A) RAM Usage
- ☐ B) Network Latency
- ☐ C) Socks5 Proxy
- ☐ D) Browser Extension

3 How does split tunneling improve overall local network speed?

- ☐ A) By Compressing Data
- ☐ B) Excludes Heavy Apps
- ☐ C) Rotates Keys
- ☐ D) Enables Kill Switch

4 What port forwarding substitute does Mullvad suggest for gamers?

- ☐ A) UPnP Protocol
- ☐ B) Direct SOCKS5 Proxy
- ☐ C) WireGuard Multihop
- ☐ D) OpenVPN TCP

5 Which overhead from encryption slightly reduces line speed?

- ☐ A) IP Packet Overhead
- ☐ B) Storage Cache Logs
- ☐ C) RAM Log Writes
- ☐ D) CPU Core Sleep

Checkpoint 2: True or False Challenge

6 Question 6

Mullvad places a maximum bandwidth throttle cap on free users.

☐

True

☐

False

7 Question 7

WireGuard uses fewer CPU resources than OpenVPN during transfers.

☐

True

☐

False

8 Question 8

Multihop routing increases throughput speeds by doubling bandwidth.

☐

True

☐

False

9 Question 9

ISP throttling can sometimes be bypassed using Mullvad tunnels.

☐

True

☐

False

10 Question 10

Higher latency ping metrics indicate faster data round-trip times.

☐

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 total volume of data processed per second is the _____metric.
2. Network response delay is measured as the round-trip _____value.
3. High-performance connections are established using the modern _____protocol.
4. Encryption headers add structure to packets, creating unavoidable _____limits.
5. VPN encryption can prevent local line speed drops caused by _____rules.
6. Chaining server locations via double routing is known as _____usage.
7. Routing application traffic locally can be done using a _____proxy.
8. Mullvad guarantees completely unrestricted, unthrottled link _____globally.

VOCABULARY WORD BANK

THROUGHU
ISPTHROT

LATENCY
MULTIHOP

WIREGUAD
SOCKS5PX

OVERHEAD
BANDWIDT

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.

THROUGHU

G A lightweight proxy used to direct traffic inside the client.

LATENCYP

A The volume of data successfully transmitted per second.

WIREGUAD

E Deliberate network speed reduction enforced by service providers.

OVERHEAD

F Routing traffic through two VPN nodes, increasing latency.

ISPTHROT

B The round-trip packet transmission time measured in milliseconds.

MULTIHOP

D Additional data added to packets for encryption and routing.

SOCKS5PX

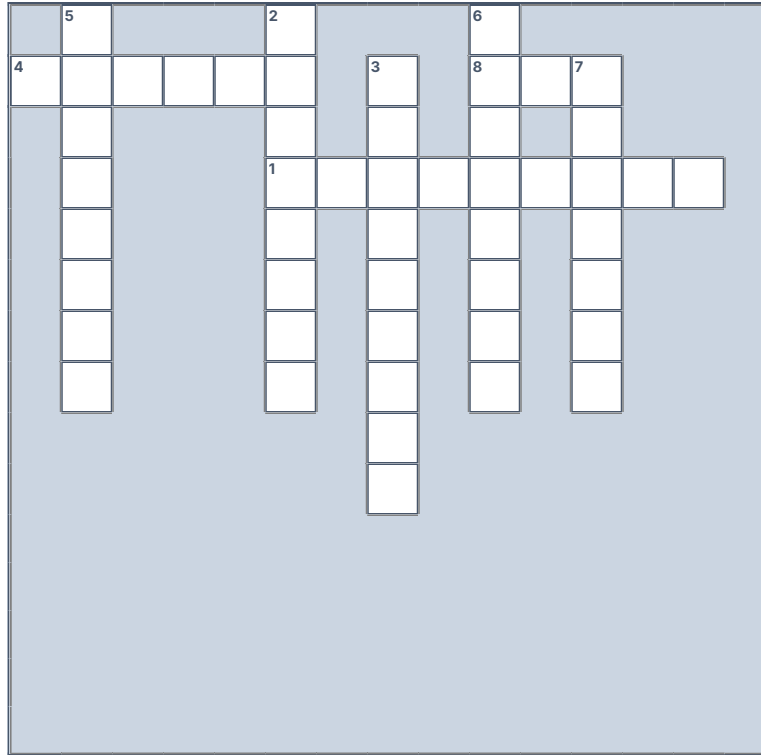
H Uncapped data transfer capacity offered on all server nodes.

BANDWIDT

C A streamlined secure tunnel protocol optimized for throughput.

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: The volume of data successfully transmitted per second. (8 letters):

3 Across: A streamlined secure tunnel protocol optimized for throughput. (8 letters):

5 Across: Deliberate network speed reduction enforced by service providers. (8 letters):

7 Across: A lightweight proxy used to direct traffic inside the client. (8 letters):

DOWN CLUES

2 Down: The round-trip packet transmission time measured in milliseconds. (8 letters):

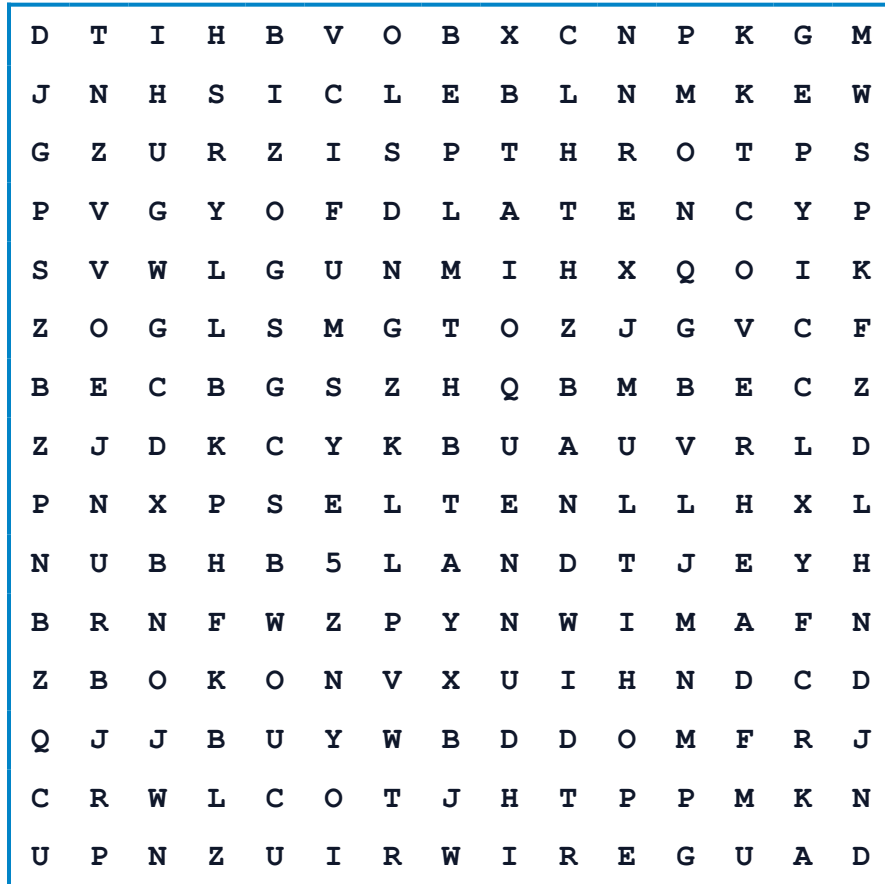
4 Down: Additional data added to packets for encryption and routing. (8 letters):

6 Down: Routing traffic through two VPN nodes, increasing latency. (8 letters):

8 Down: Uncapped data transfer capacity offered on all server nodes. (8 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

THROUGHU
ISPTROT

LATENCY
MULTIHOP

WIREGUAD
SOCKS5PX

OVERHEAD
BANDWIDT

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. THROUGHU
- B. LATENCY
- C. WIREGUAD
- D. OVERHEAD
- E. ISPTROT
- F. MULTIROP
- G. SOCKS5PX
- H. BANDWIDT

DEFINITIONS & MATCH FIELDS

- 1. The volume of data successfully transmitted per second.
- 2. The round-trip packet transmission time measured in milliseconds.
- 3. A streamlined secure tunnel protocol optimized for throughput.
- 4. Additional data added to packets for encryption and routing.
- 5. Deliberate network speed reduction enforced by service providers.
- 6. Routing traffic through two VPN nodes, increasing latency.
- 7. A lightweight proxy used to direct traffic inside the client.
- 8. Uncapped data transfer capacity offered on all server nodes.

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. HROUGHUT

5. SPTHROTI

2. ATENCYPL

6. ULTIHOPM

3. IREGUADW

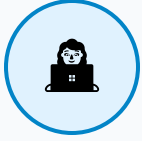
7. OCKS5PXS

4. VERHEADO

8. ANDWIDTB

Checkpoint 8: VPN & Network Case Studies

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



CASE STUDY 1: THROUGHPUT OPTIMIZATION ANALYSIS

Scenario: A video editing studio experiences slow upload speeds when uploading raw files via VPN.

Discussion Question: What troubleshooting step should they take in the Mullvad settings?



CASE STUDY 2: GAMING LATENCY MITIGATION

Scenario: A competitive gamer experiences rubberbanding and high ping when connected to the VPN.

Discussion Question: What server selection rule should they follow to reduce latency?

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

23	9	18	5	7	21	1	18	4	20	21	14	14	5	12	19		
4	5	12	9	22	5	18	13	1	24	9	13	21	13	4	1	20	1
20	8	18	15	21	7	8	16	21	20	19	16	5	5	4			

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: Does Mullvad throttle speeds?

No, Mullvad provides completely uncapped and unthrottled speeds to all users.

Q2: Which is faster, WireGuard or OpenVPN?

WireGuard is significantly faster due to its efficient codebase and kernel-space execution.

Q3: What affects VPN speed?

Server distance, local line quality, network congestion, and router hardware capacity.

Q4: Does Mullvad support port forwarding?

Mullvad no longer supports port forwarding to prevent user abuse and enhance privacy.

Q5: How does distance affect latency?

The physical distance data must travel to the server directly increases round-trip ping time.

Checkpoint 10: Basic VPN FAQs (Part B)

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

Q6: Can I use Mullvad for gaming?

Yes, choosing a nearby server with low ping ensures a stable gaming connection.

Q7: Does encryption slow down speed?

Encryption adds slight packet overhead, which can reduce throughput by 5-10% depending on hardware.

Q8: How can I speed up Mullvad?

Switch to WireGuard, select a closer server, or connect via an Ethernet cable.

Q9: Does multihop affect speed?

Yes, multihop routes traffic through two servers, which increases latency and reduces speed.

Q10: What is MTU in Mullvad?

Maximum Transmission Unit; optimizing MTU prevents packet fragmentation speed drops.

Checkpoint 11: Advanced VPN FAQs (Part A)

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

Q1: Why is OpenVPN TCP slower?

TCP requires confirmation for every packet sent, adding heavy verification overhead.

Q2: How does SOCKS5 proxy help speed?

It lets you route specific applications directly without wrapping the entire operating system network stack.

Q3: What is the speed impact of bridges?

Bridges add an extra proxy layer, which increases latency and reduces maximum throughput.

Q4: How do RAM-only servers scale speed?

RAM execution speeds up read/write performance compared to traditional hard disks.

Q5: Why does my connection drop occasionally?

It could be due to MTU mismatches or local router security rules blocking UDP packets.

Checkpoint 11: Advanced VPN FAQs (Part B)

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

Q6: How does CPU power affect VPN speed?

Older routers or computers may struggle to encrypt data fast enough, bottle-necking speeds.

Q7: What is bandwidth throttling?

It is the intentional slowing of internet speed by ISPs; Mullvad bypasses it via encryption.

Q8: Is Mullvad's server network 10 Gbps?

Yes, Mullvad is constantly upgrading its server backbone nodes to 10 Gbps and 20 Gbps connections.

Q9: How does split tunneling affect utility?

It lets high-bandwidth local apps run outside the VPN while keeping browser traffic secure.

Q10: Does IPv6 routing slow connections?

No, Mullvad implements optimized native dual-stack IPv4/IPv6 routing to keep performance high.

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

Mullvad offers completely uncapped bandwidth with zero throttling limits.

2. VPN INSIGHT

WireGuard protocol execution in kernel space maximizes data throughput speeds.

3. VPN INSIGHT

Network latency is determined by the speed of light traveling through fiber-optic cables.

4. VPN INSIGHT

Mullvad's server infrastructure uses high-bandwidth 10 Gbps and 20 Gbps ports.

5. VPN INSIGHT

Encryption processing on low-powered routers can restrict overall VPN throughput.

6. VPN INSIGHT

Setting MTU incorrectly causes packet fragmentation, dropping connection speeds.

7. VPN INSIGHT

Multihop routing doubles encryption processing, increasing latency on all pings.

8. VPN INSIGHT

Local DNS resolvers on Mullvad nodes speed up host lookup query times.

9. VPN INSIGHT

ISP bandwidth throttling is neutralized by encrypting network packet headers.

10. VPN INSIGHT

SOCKS5 proxies bypass operating system overhead, offering fast application routing.

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: C

TEACHING NOTE

Which protocol offers the highest download throughput in Mullvad?

Citation: IETF VPN RFC [Ref 3].

2 Network Check 2

VPN PROTECTION

Correct Answer: B

TEACHING NOTE

What is the primary factor limiting VPN speed over long distances?

Citation: IETF VPN RFC [Ref 3].

3 Network Check 3

VPN PROTECTION

Correct Answer: B

TEACHING NOTE

How does split tunneling improve overall local network speed?

Citation: IETF VPN RFC [Ref 3].

4 Network Check 4

VPN PROTECTION

Correct Answer: B

TEACHING NOTE

What port forwarding substitute does Mullvad suggest for gamers?

Citation: IETF VPN RFC [Ref 3].

5 Network Check 5

VPN PROTECTION

Correct Answer: A

TEACHING NOTE

Which overhead from encryption slightly reduces line speed?

Citation: IETF VPN RFC [Ref 3].

Answer Key: Checkpoint 2 - True or False

6 Network Rule 1

VPN PROTECTION

Correct Answer: False

TEACHING NOTE

Mullvad places a maximum bandwidth throttle cap on free users.

Citation: IETF VPN RFC [Ref 3].

7 Network Rule 2

VPN PROTECTION

Correct Answer: True

TEACHING NOTE

WireGuard uses fewer CPU resources than OpenVPN during transfers.

Citation: IETF VPN RFC [Ref 3].

8 Network Rule 3

VPN PROTECTION

Correct Answer: False

TEACHING NOTE

Multihop routing increases throughput speeds by doubling bandwidth.

Citation: IETF VPN RFC [Ref 3].

9 Network Rule 4

VPN PROTECTION

Correct Answer: True

TEACHING NOTE

ISP throttling can sometimes be bypassed using Mullvad tunnels.

Citation: IETF VPN RFC [Ref 3].

10 Network Rule 5

VPN PROTECTION

Correct Answer: False

TEACHING NOTE

Higher latency ping metrics indicate faster data round-trip times.

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 THROUGHU

B LATENCY

C WIREGUAD

D OVERHEAD

E ISPTHROT

F MULTIROP

G SOCKS5PX

H BANDWIDT

CHECKPOINT 3: KEY TERM KEY

1 THROUGHU

2 LATENCY

3 WIREGUAD

4 OVERHEAD

5 ISPTHROT

6 MULTIROP

7 SOCKS5PX

8 BANDWIDT

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

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

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	G
		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. HROUGHUT

THROUGHU

5. SPTHROTI

ISPTHROT

2. ATENCYPL

LATENCYP

6. ULTIHOPM

MULTIHOP

3. IREGUADW

WIREGUAD

7. OCKS5PXS

SOCKS5PX

4. VERHEADO

OVERHEAD

8. ANDWIDTB

BANDWIDT

SECRET CIPHER CHALLENGE KEY

**"WIREGUARD TUNNELS DELIVER MAXIMUM DATA
THROUGHPUT SPEED"**

VPN & Network Case Studies Solution Key

A Case Study 1: Throughput Optimization Analysis

[Instructor Solution](#)

GRADING GUIDELINE

Student answers should cover the following points:

- **Scenario Analysis:** A video editing studio experiences slow upload speeds when uploading raw files via VPN.
- **Recommended Strategy & Solution:** Switch to WireGuard and adjust the MTU size to reduce packet fragmentation.

B Case Study 2: Gaming Latency Mitigation

[Instructor Solution](#)

GRADING GUIDELINE

Student answers should cover the following points:

- **Scenario Analysis:** A competitive gamer experiences rubberbanding and high ping when connected to the VPN.
- **Recommended Strategy & Solution:** Select the server physically closest to the game host location.