Name: _____ Date: _____ Score: _____

# ProtonVPN Speed Test

Benchmarking ProtonVPN connection performance including VPN Accelerator technology, 10 Gbps server network, WireGuard protocol throughput, and latency reduction.

## PROTONVPN SPEED TEST LEARNING OVERVIEW

**LEARNER**
STUDENT STATUS
Network Defender Track

**SECURE**
CONNECTION STATUS
Shielding data packets

**ON**
LEAK PROTECTION
DNS & IPv6 leak protection

**Welcome! This activity packet guides you through Proton** VPN speed benchmarks. You will explore VPN Accelerator technology, 10 Gbps server interfaces, WireGuard throughput, and latency reduction.

### 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.**
- [ ] **Bonus: Think Fast challenge.**

**Open the VPN.com Best VPNs Guide**

URL: https://www.vpn.com/vpn/protonvpn/speed-test/

# Your ProtonVPN Speed Learning Roadmap

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

### PROTONVPN 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 VPN Accelerator technology and 10 Gbps network nodes. Finish with the Bonus Activity: Think Fast.

### VPN ACCELERATOR PERFORMANCE & 10 GBPS INFRASTRUCTURE (INTRODUCTION)

Proton VPN delivers high connection throughput via its proprietary VPN Accelerator technology, multi-threaded CPU processing, BBR congestion control, and 10 Gbps server network interfaces.

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

## Checkpoint 1: Multiple Choice Challenge

**1. What proprietary technology accelerates Proton speeds up to 400%?**

- A) QuickConnect
- B) VPN Accelerator
- C) Speed Engine
- D) Turbo Mode

**2. What is the network port capacity on Proton's top server nodes?**

- A) 100 Mbps
- B) 1 Gbps
- C) 10 Gbps
- D) 100 Gbps

**3. Which protocol typically provides the fastest download throughput?**

- A) OpenVPN TCP
- B) WireGuard
- C) PPTP
- D) IKEv2

**4. How does VPN Accelerator overcome CPU bottlenecks?**

- A) Multi-threading
- B) Lower Encryption
- C) Skipping Packets
- D) DNS Caching

**5. What indicator in the Proton app helps choose fast servers?**

- A) City Name
- B) Server Load %
- C) Alphabetical
- D) Country Flag

## Checkpoint 2: True or False Challenge

### 6 Question 6

6. VPN Accelerator uses BBR congestion control to speed up long-distance links.

○ True ○ False

### 7 Question 7

7. Free tier users have access to the full 10 Gbps high-speed server network.

○ True ○ False

### 8 Question 8

8. WireGuard protocol offers higher throughput than legacy OpenVPN protocols.

○ True ○ False

### 9 Question 9

9. Connecting to geographically proximate servers generally results in lower ping.

○ True ○ False

### 10 Question 10

10. Split tunneling can improve streaming speed by excluding heavy bandwidth apps.

○ 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. Advanced packet routing technology that increases throughput is called _____ engine.

2. High-capacity backbone network servers are equipped with _____ connections.

3. The total volume of data successfully transferred per second is the _____ rate.

4. The round-trip delay measured in milliseconds between client and server is _____ metric.

5. Users select optimal connection points by checking the active server _____ meter.

6. Processing crypto algorithms across multiple CPU cores is achieved by _____ design.

**VOCABULARY WORD BANK**

ACCELERATOR BANDWIDTH LATENCY MULTITHREAD SERVER LOAD
TCP BOTTLENECK TEN GIGABIT THROUGHPUT

**Write your answers here:**

1. 
2. 
3. 
4. 
5. 
6. 

# Checkpoint 4: VPN & Network Concept Match

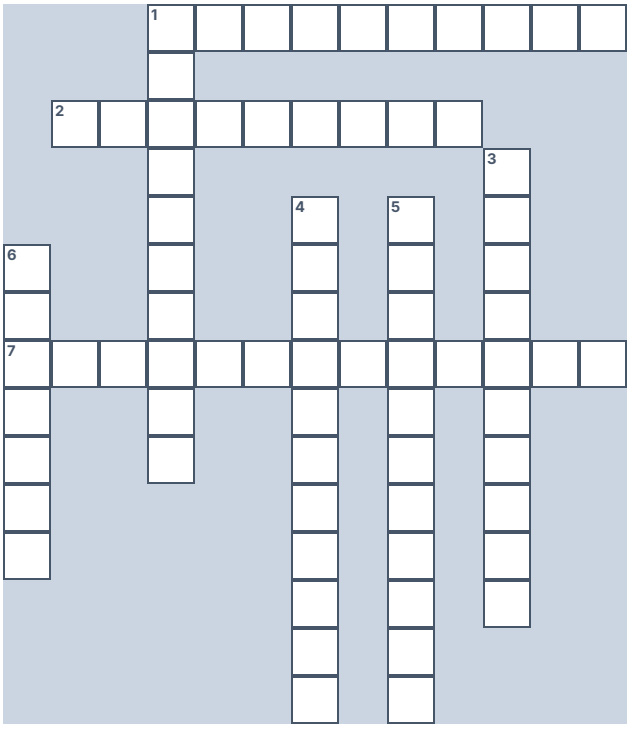
## DEFINITION MATCHING

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.

| | | | |
|---|---|---|---|
| ☐ | 1. ACCELERATOR | A | Performance degradation caused by standard TCP congestion control bottlenecks. |
| ☐ | 2. TEN GIGABIT | B | The maximum data transmission capacity of a dedicated network connection. |
| ☐ | 3. THROUGHPUT | C | The percentage capacity of a server currently utilized by connected users. |
| ☐ | 4. LATENCY | D | High-capacity infrastructure supporting ten gigabit per second throughput. |
| ☐ | 5. SERVER LOAD | E | A suite of performance optimizations boosting connection speeds by up to 400%. |
| ☐ | 6. MULTITHREAD | F | The time delay in milliseconds required for network packets to travel round-trip. |
| ☐ | 7. BANDWIDTH | G | The measured rate of payload data transferred across a network per second. |
| ☐ | 8. TCP BOTTLENECK | H | Distributing cryptographic tasks across multiple processor cores simultaneously. |

## Checkpoint 5: Crossword Puzzle

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




### ACROSS CLUES

**1. The measured rate of payload data transferred across a network per second (10)**

**2. The maximum data transmission capacity of a dedicated network connection (9)**

**7. Performance degradation caused by standard TCP congestion control bottlenecks (13)**

### DOWN CLUES

**1. High-capacity infrastructure supporting ten gigabit per second throughput (10)**

**3. The percentage capacity of a server currently utilized by connected users (10)**

**4. Distributing cryptographic tasks across multiple processor cores simultaneously (11)**

**5. A suite of performance optimizations boosting connection speeds by up to 400% (11)**

**6. The time delay in milliseconds required for network packets to travel round-trip (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 measured rate of payload data transferred across a network per second (10 letters):**

**2 Across: The maximum data transmission capacity of a dedicated network connection (9 letters):**

**7 Across: Performance degradation caused by standard TCP congestion control bottlenecks (13 letters):**

## DOWN CLUES

**1 Down: High-capacity infrastructure supporting ten gigabit per second throughput (10 letters):**

**3 Down: The percentage capacity of a server currently utilized by connected users (10 letters):**

**4 Down: Distributing cryptographic tasks across multiple processor cores simultaneously (11 letters):**

**5 Down: A suite of performance optimizations boosting connection speeds by up to 400% (11 letters):**

**6 Down: The time delay in milliseconds required for network packets to travel round-trip (7 letters):**

## Checkpoint 6: Hidden Word Search

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

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

**VOCABULARY WORD LIST**

ACCELERATOR TENGIGABIT THROUGHPUT LATENCY SERVERLOAD
MULTITHREAD BANDWIDTH TCPBOTTLENECK

## 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. ACCELERATOR**
- **B. TENGIGABIT**
- **C. THROUGHPUT**
- **D. LATENCY**
- **E. SERVERLOAD**
- **F. MULTITHREAD**
- **G. BANDWIDTH**
- **H. TCPBOTTLENECK**

**DEFINITIONS & MATCH FIELDS**

_____ 1. The measured rate of payload data transferred across a network per second.

_____ 2. The percentage capacity of a server currently utilized by connected users.

_____ 3. High-capacity infrastructure supporting ten gigabit per second throughput.

_____ 4. The maximum data transmission capacity of a dedicated network connection.

_____ 5. Performance degradation caused by standard TCP congestion control bottlenecks.

_____ 6. A suite of performance optimizations boosting connection speeds by up to 400%.

_____ 7. The time delay in milliseconds required for network packets to travel round-trip.

_____ 8. Distributing cryptographic tasks across multiple processor cores simultaneously.

## 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. LROCEAATCRE
2. UOTHUTHPGR
3. SRALEEDVOR
4. WHTDDIBAN
5. BGTEGAITIN
6. CTNLEYA
7. RIMUHDEALTT
8. EPOTELKTTCCNB

# Bonus Activity: Think Fast

3 ITEMS FROM EACH CATEGORY. FIRST PERSON TO COMPLETE THE LIST WINS.

| | | | | |
|---|---|---|---|---|
| 1 | Features you look for in Proton VPN | | | |
| 2 | Questions for Proton VPN customer support | | | |
| 3 | Streaming services you watch | | | |
| 4 | Words that describe a good VPN app | | | |
| 5 | Things that can slow a VPN down | | | |
| 6 | Tips for getting a lower ping | | | |
| 7 | Data a VPN should never store | | | |
| 8 | Activities that need high speed | | | |
| 9 | Things you do when a video stutters | | | |
| 10 | Countries where you'd want Proton VPN servers | | | |
| 11 | Words related to speed | | | |
| 12 | Things Proton VPN can hide from your network | | | |
| 13 | Ways to test your internet speed | | | |
| 14 | Units for measuring internet speed | | | |
| 15 | Games or apps that need low latency | | | |

# Checkpoint 8: VPN & Network Case Studies

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

## CASE STUDY 1: 4K STREAMING LATENCY REDUCTION

👷

**Scenario: A household experiences buffering while streaming 4K video over Proton** VPN.

**Discussion Question: What adjustments should be made in server selection and** protocol to eliminate buffering?

## CASE STUDY 2: MULTI-CORE PROCESSOR OPTIMIZATION

👷

**Scenario: A gaming desktop with a 16-core CPU suffers frame rate lag when VPN** tunneling is active.

**Discussion Question: How does VPN Accelerator utilize multi-threading to maintain** high transmission rates?

## Checkpoint 9: 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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3 | 3 | 5 | 12 | 5 | 18 | 1 | 20 | 15 | 18 |
| | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 5 | 3 | 8 | 14 | 15 | 12 | 15 | 7 | 25 | | 4 | 5 | 12 | 9 | 22 | 5 | 18 | 19 |
| | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 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 is Proton VPN Accelerator?

VPN Accelerator is a set of unique technologies that increase VPN speeds by up to 400%. [1]

### Q2: Which protocol is the fastest on Proton VPN?

WireGuard is generally the fastest protocol, offering superior throughput and low latency.

### Q3: What server network speed does Proton VPN use?

Proton VPN operates 10 Gbps server network cards across major tier-1 server locations.

### Q4: How does server load affect VPN speed?

Higher server load can reduce speeds, so choosing a server with a lower load % usually helps.

### Q5: Does Proton VPN throttle bandwidth?

No, Proton VPN imposes zero bandwidth throttling on both free and paid subscription plans.

# Checkpoint 10: Basic VPN FAQs (Part B)

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

### Q6: Can Proton VPN reduce ping for gaming?

Connecting to a VPN server close to game servers with optimized routing can lower and stabilize ping.

### Q7: How do I choose the fastest server?

Use the Quick Connect feature or select the nearest country with the lowest server load percentage.

### Q8: Why does OpenVPN feel slower than WireGuard?

OpenVPN has older architecture and higher CPU overhead compared to lightweight WireGuard.

### Q9: Does VPN Accelerator work on all platforms?

Yes, VPN Accelerator is built into the Windows, macOS, Linux, Android, and iOS clients. [1]

### Q10: Can split tunneling increase internet speed?

Yes, routing only sensitive apps through the VPN frees up local bandwidth for other downloads.

# Checkpoint 10: Advanced VPN FAQs (Part C)

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

### Q1: How does VPN Accelerator rewrite TCP congestion controls?

It uses advanced BBR congestion control and splits long paths into shorter optimized hops. [1]

### Q2: How does multithreading work in VPN Accelerator?

It runs multiple OpenVPN processes per server so the work is spread across several CPU cores. [1]

### Q3: What is the impact of Secure Core on download speed?

Secure Core adds a second server hop, which increases latency and reduces speed slightly.

### Q4: Does Proton VPN support jumbo MTU frames?

WireGuard configurations automatically negotiate optimal MTU size to prevent packet fragmentation.

### Q5: How does Proton handle ISP peering bottlenecks?

VPN Accelerator splits long connections into shorter segments to reduce distant congestion.

## Checkpoint 10: Advanced VPN FAQs (Part D)

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

**Q6: Can I perform command-line speed tests on Linux?**

Yes, using the Proton VPN CLI and speedtest-cli allows measuring throughput via terminal.

**Q7: Does NetShield ad blocking improve web page load speed?**

Yes, blocking heavy third-party tracker scripts and ads reduces data payload and load times.

**Q8: What throughput speeds are achievable on 10 Gbps servers?**

Real speeds depend on your line, device and distance; servers offer connections of up to 10 Gbps.

**Q9: How does router installation affect network throughput?**

Routers with weak CPUs may bottleneck OpenVPN encryption; high-end routers maintain full speed.

**Q10: Does Proton VPN provide specialized P2P torrenting servers?**

Yes, dedicated P2P-optimized servers are marked in the server list for maximum download speed.

## 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**

1. Proton VPN Accelerator can increase connection throughput by over 400% on long-distance links. [1]

**2. VPN INSIGHT**

2. Proton VPN operates 10 Gbps server interfaces across its core global datacenter locations. [2]

**3. VPN INSIGHT**

3. WireGuard uses state-of-the-art Noise protocol cryptography for faster connection handshakes. [6]

**4. VPN INSIGHT**

4. NetShield speeds up browsing by blocking resource-heavy advertising tracking scripts at DNS level. [4]

**5. VPN INSIGHT**

5. Multi-core processor scheduling reduces single-thread bottlenecks in cryptographic operations.

**6. VPN INSIGHT**

6. Connecting to geographically nearby servers helps keep latency and gaming ping low.

**7. VPN INSIGHT**

7. BBR congestion control algorithms maintain high throughput even on unstable packet loss networks. [7]

**8. VPN INSIGHT**

8. P2P-optimized servers are specifically engineered for high-bandwidth torrenting and file sharing.

**9. VPN INSIGHT**

9. Quick Connect picks a fast server for you automatically, based on factors such as location and load.

**10. VPN INSIGHT**

10. Proton VPN imposes no artificial bandwidth caps or monthly transfer limits on any user tier. [3]

# 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** **VPN Accelerator Technology** SPEED BOOSTER — **Correct Answer: B**

### TEACHING NOTE

VPN Accelerator combines multithreaded processing with advanced TCP congestion control algorithms (BBR) which Proton says can boost throughput by up to 400%.

**2** **Server Interface Capacity** PORT BANDWIDTH — **Correct Answer: C**

### TEACHING NOTE

Proton's primary tier server fleet utilizes high-capacity 10 Gbps network ports to prevent bandwidth saturation during peak international usage.

**3** **Question 3** — **Correct Answer: B**

### TEACHING NOTE

WireGuard is lighter and more efficient than older OpenVPN, so it usually gives higher throughput.

**4** **Multithreaded Processing** CPU OPTIMIZATION — **Correct Answer: A**

### TEACHING NOTE

VPN Accelerator breaks single-threaded OpenVPN limitations by distributing packet encryption across all available multi-core CPU threads.

**5** **Server Load Monitoring** SERVER SELECTION — **Correct Answer: B**

### TEACHING NOTE

The server load percentage indicator in the Proton app shows real-time capacity utilization, guiding users to select less congested nodes.

## Answer Key: Checkpoint 2 - True or False

### 6 Question 6

**Correct Answer: True**

#### TEACHING NOTE

True: Proton says VPN Accelerator uses the BBR algorithm and splits long paths into shorter segments.

### 7 Question 7

**Correct Answer: False**

#### TEACHING NOTE

False: Proton lists the free plan at medium speed, while the highest speeds are for paid plans.

### 8 WireGuard vs OpenVPN Throughput

THROUGHPUT BENCHMARKS

**Correct Answer: True**

#### TEACHING NOTE

WireGuard's modern cryptographic primitives (ChaCha20-Poly1305) provide significantly higher throughput than OpenVPN on modern CPUs.

### 9 Proximity and Ping Metrics

ROUTING LATENCY

**Correct Answer: True**

#### TEACHING NOTE

Selecting servers located physically closer to the user reduces fiber-optic transit distance, resulting in lower ping and faster page loading.

### 10 Split Tunneling Efficiency

BANDWIDTH ROUTING

**Correct Answer: True**

#### TEACHING NOTE

Excluding high-bandwidth local applications from the VPN tunnel reduces encryption overhead and frees up tunnel throughput for secure traffic.

# 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

| | | | |
|---|---|---|---|
| E 1. ACCELERATOR | D 2. TEN GIGABIT | G 3. THROUGHPUT | F 4. LATENCY |
| C 5. SERVER LOAD | H 6. MULTITHREAD | B 7. BANDWIDTH | A 8. TCP BOTTLENECK |

## CHECKPOINT 3: KEY TERM KEY

| | | | |
|---|---|---|---|
| 1 ACCELERATOR | 2 TEN GIGABIT | 3 THROUGHPUT | 4 LATENCY |
| 5 SERVER LOAD | 6 MULTITHREAD | | |

## CHECKPOINT 6 ALTERNATIVE: VOCABULARY MATCH KEY

| | | | |
|---|---|---|---|
| 1 C – THROUGHPUT | 2 E – SERVERLOAD | 3 B – TENGIGABIT | 4 G – BANDWIDTH |
| 5 H – TCPBOTTLENECK | 6 A – ACCELERATOR | 7 D – LATENCY | 8 F – MULTITHREAD |

## DISCUSSION NOTES FOR INSTRUCTORS

**Key Terms:**
Check that students can explain ACCELERATOR, TEN GIGABIT and THROUGHPUT in their own words and give an example of each.

**Case Studies:**
Ask students to support their recommendations with facts from the worksheet rather than assumptions.

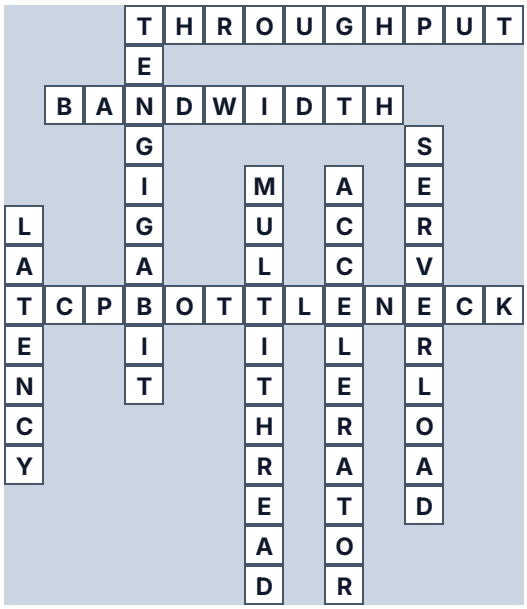
**Source Evaluation:**
Have students verify at least one claim against the worksheet references, and discuss why figures, prices and rules can change over time.

# Puzzles Keys & Instructor Notes

## WORD SEARCH SOLUTION

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

## CROSSWORD SOLUTION




## INSTRUCTOR GUIDE FOR CROSSWORD SOLUTIONS

### ACROSS CLUES

**1 Across: THROUGHPUT** The measured rate of payload data transferred across a network per second (10 letters)

**2 Across: BANDWIDTH** The maximum data transmission capacity of a dedicated network connection (9 letters)

**7 Across: TCPBOTTLENECK** Performance degradation caused by standard TCP congestion control bottlenecks (13 letters)

### DOWN CLUES

**1 Down: TENGIGABIT** High-capacity infrastructure supporting ten gigabit per second throughput (10 letters)

**3 Down: SERVERLOAD** The percentage capacity of a server currently utilized by connected users (10 letters)

**4 Down: MULTITHREAD** Distributing cryptographic tasks across multiple processor cores simultaneously (11 letters)

**5 Down: ACCELERATOR** A suite of performance optimizations boosting connection speeds by up to 400% (11 letters)

**6 Down: LATENCY** The time delay in milliseconds required for network packets to travel round-trip (7 letters)

# Scrambled Words & Cipher Solution Key

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

### WORD UNSCRAMBLE KEY

| | | | |
|---|---|---|---|
| 1. LROCEAATCRE | ACCELERATOR | 5. BGTEGAITIN | TENGIGABIT |
| 2. UOTHUTHPGR | THROUGHPUT | 6. CTNLEYA | LATENCY |
| 3. SRALEEDVOR | SERVERLOAD | 7. RIMUHDEALTT | MULTITHREAD |
| 4. WHTDDIBAN | BANDWIDTH | 8. EPOTELKTTCCNB | TCPBOTTLENECK |

### SECRET CIPHER CHALLENGE KEY

**"ACCELERATOR TECHNOLOGY DELIVERS MAXIMUM DATA THROUGHPUT SPEED"**

# Case Studies Solution Key

## A CASE STUDY 1: 4K STREAMING LATENCY REDUCTION

Instructor Solution

### GRADING RUBRIC & SOLUTION GUIDELINES

- Scenario Analysis: A household experiences buffering while streaming 4K video over Proton VPN.
- Focus Question: What adjustments should be made in server selection and protocol to eliminate buffering?
- Recommended Strategy & Solution: Switch to WireGuard, enable VPN Accelerator, and pick a nearby server under 40% load.

## B CASE STUDY 2: MULTI-CORE PROCESSOR OPTIMIZATION

Instructor Solution

### GRADING RUBRIC & SOLUTION GUIDELINES

- Scenario Analysis: A gaming desktop with a 16-core CPU suffers frame rate lag when VPN tunneling is active.
- Focus Question: How does VPN Accelerator utilize multi-threading to maintain high transmission rates?
- Recommended Strategy & Solution: VPN Accelerator spreads packet encryption across all CPU cores, removing single-thread bottlenecks.