

**riverbed**

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**Riverbed Certified Solutions Professional –  
WAN Optimization (RCSP-W)  
Exam Prep/Blueprint**

Exam 199-01

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NetApp Manageability Software Development Kit (NM SDK), including any third-party software available for review with such SDK which can be found at <http://communities.netapp.com/docs/DOC-1152>, and are included in a NOTICES file included within the downloaded files.

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## Preface

This Riverbed® certification blueprint is intended for anyone who wants to become certified in the Riverbed WAN Optimization products and solutions, and Riverbed Optimization System (RiOS®). The Riverbed Certified Solutions Professional – WAN Optimization (RCSP-W) program is designed to validate the skills required of technical professionals who work in the implementation of Riverbed products and services, WAN optimization, and application acceleration.

This blueprint provides a combination of theory and practical experience needed for a general understanding of the subject matter. It also provides sample questions that will help in the evaluation of personal progress and provide familiarity with the types of questions that will be encountered in the exam.

***This publication does not replace practical experience, nor is it designed to be a stand-alone guide for any subject. Instead, it is an effective tool that, when combined with education activities and experience, can be a very useful preparation guide for the exam.***

## Certification Overview

The Riverbed Certified Solutions Professional – WAN optimization certificate is granted to individuals who demonstrate advanced knowledge and experience with the RiOS® product suite. The typical RCSP-W will have taken a Riverbed approved training class such as the *WAN200 Optimization Essentials*, *WAN310 Optimizing Enterprise Applications and Protocols*, and the *WAN350 Implementing Enterprise Optimization Architectures* courses in addition to having hands-on experience in performing deployment, troubleshooting, and maintenance of RiOS® products in small, medium, and large organizations. While there are no set requirements prior to taking the exam, candidates who have taken a Riverbed authorized training class and have at least six months of hands-on experience with RiOS® products have a significantly higher chance of receiving the certification. We would like to emphasize that *solely* taking the class will not adequately prepare you for the exam.

To obtain the RCSP-W certification, you are required to pass a computerized exam available at any Pearson VUE testing center worldwide.

## Benefits of Certification

1. Establishes your credibility as a knowledgeable and capable individual in regard to Riverbed products and services, WAN optimization, and application acceleration.
2. May help improve your career advancement potential.
3. Entitles you to use the RCSP-W certification logo on your business card.
4. Enables you to join Riverbed's RCSP Members only Splash community group.

## Exam Information

### Exam Specifications

- **Exam Number:** 199-01
- **Exam Name:** Riverbed Certified Solutions Professional – WAN Optimization
- **Version of RiOS:** Up to RiOS version 3.6.0 for the SteelHead EX appliances and VSP; version 9.0.0 for the SteelHead and SteelHead™ (virtual edition); version 9.0.0 for the SteelCentral™ Controller for SteelHead, version 4.0.1 for Interceptor, and version 4.5.1 for the SteelCentral™ Controller for SteelHead Mobile.
- **Number of Questions:** 60
- **Total Time:** 75 minutes for exam, 15 minutes for Survey and Tutorial (90 minutes total)
- **Exam Provider:** Pearson VUE
- **Exam Language:** English only. Riverbed allows a 30-minute time extension for exams taken in non-English speaking countries for students that request it. English speaking countries are Australia, Bermuda, Canada, Ireland, New Zealand, United Kingdom, South Africa, and the United States. A form will need to be completed by the candidate and submitted to Pearson VUE.
- **Special Accommodations:** Yes (must submit written request to Pearson VUE for ESL or ADA accommodations; includes time extensions and/or a reader)
- **Offered Locations:** Worldwide (over 4000 Pearson VUE test centers in 165 countries)
- **Prerequisites:** None (although taking a Riverbed training class is highly recommended)
- **Available to:** Partners, customers, and employees
- **Passing Score:** 70%
- **Certification Expires:** Every two years (must recertify every two years, with six month grace period)
- **Recertification Criteria:** Retake the 199-01 – RCSP-W current exam. If you are a RCSA-W certified, retaking the 199-01 – RCSP-W exam will also re-certify your RCSA-W.
- **Wait Between Failed Attempts:** 72 hours
- **Wait Between Passed Exams:** One year
- **Cost:** \$225.00 (USD)
- **Number of Attempts Allowed:** Unlimited

### Certification Checklist

As the RCSP-W exam is geared towards individuals who have both the theoretical knowledge and hands on experience with the RiOS product suite, ensuring proficiency in both areas is crucial towards passing the exam. For individuals starting out with the process, we recommend the following steps to guide you along the way:

#### 1. Building Theoretical Knowledge

The easiest way to become knowledgeable in deploying, maintaining, and troubleshooting the RiOS® product suite is to take a Riverbed authorized training class. To ensure the greatest possibility of passing the exam, it is recommended that you review the RCSP-W Blueprint and Study Reference and ensure your familiarity with all topics listed, prior to any examination attempts.

**2. Gaining Hands-on Experience**

While the theoretical knowledge will get you partway there, it is the hands-on knowledge that can get you over the top and enable you to pass the exam. Since all deployments are different, providing an exact amount of experience required is difficult. Generally, we recommend that resellers and partners perform at least five deployments in a variety of technologies prior to attempting the exam. For customers, and alternatively for resellers and partners, starting from the design and deployment phase and having *at least six months of experience* in a production environment would be beneficial.

**3. Taking the Exam**

The final step in becoming an RCSP-W is to take the exam at a Pearson VUE authorized testing center. To register for any Riverbed Certification exam, please visit <http://www.pearsonvue.com/riverbed>.

## RIVERBED CERTIFIED SOLUTIONS PROFESSIONAL – WAN OPTIMIZATION (RCSP-W) BLUEPRINT AND STUDY REFERENCES

The Riverbed Certified Solutions Professional exam, and therefore this blueprint, covers the Riverbed products and technologies up to RiOS version 2.0.2 for the SteelHead EX appliances and VSP; version 8.0.4 for the SteelHead and SteelHead™ (virtual edition); version 8.0.0a for the SteelCentral™ Controller for SteelHead, version 4.0.1 for Interceptor, and version 4.0.3 for the SteelCentral™ Controller for SteelHead Mobile.

*This publication does not replace practical experience, nor is it designed to be a stand-alone guide for any subject. Instead, it is an effective tool that, when combined with education activities and experience, can be a very useful preparation guide for the exam.*

### Riverbed Recommended Training Courses

- WAN200 Optimization Essentials
- WAN310 Optimizing Enterprise Applications and Protocols
- WAN350 Implementing Enterprise Optimization Architectures

Additional Information on Riverbed Training can be found at:

<http://www.riverbed.com/services-training/training/>. You can also write to [training@riverbed.com](mailto:training@riverbed.com).

Riverbed authorized training courses and Riverbed Certification are mutually exclusive programs. This means that certification is not directly mapped to specific training courses and vice versa. We recommend certain courses but in no way does that automatically qualify or prepare you for the exam.

To access Riverbed technical documentation and publications please visit Riverbed Support webpage at <https://support.riverbed.com/index.htm>

### General Knowledge

Subject	Reference
TCP	<a href="http://www.ietf.org/rfc.html">http://www.ietf.org/rfc.html</a> <ul style="list-style-type: none"> <li>• RFC 793 (Original TCP RFC)</li> <li>• RFC 1323 TCP extensions for high performance</li> <li>• RFC 3649 (HighSpeed TCP for Large Congestion Windows)</li> <li>• RFC 3742 (Limited Slow-Start for TCP with Large Congestion Windows)</li> <li>• RFC 2474 (Differentiated Services Code Point)</li> </ul> TCP/IP Illustrated, Volume I, The Protocols by W. R. Stevens (Addison-Wesley, 1994)
NetFlow	<a href="http://www.caida.org/tools/utilities/flowscan/arch.xml">http://www.caida.org/tools/utilities/flowscan/arch.xml</a>
Embedded NetShark	<a href="https://supportkb.riverbed.com/support/index?page=content&amp;id=S16021">https://supportkb.riverbed.com/support/index?page=content&amp;id=S16021</a>

Deployment Options	<a href="http://tools.ietf.org/id/draft-wilson-wrec-wccp-v2-01.txt">http://tools.ietf.org/id/draft-wilson-wrec-wccp-v2-01.txt</a> <ul style="list-style-type: none"> <li>Riverbed® Deployment Guide v9.0 – Chapter 11: WCCP Virtual In-Path Deployments</li> <li>Riverbed® Deployment Guide v9.0– Chapter 12: Policy-Based Routing In-Path Deployments</li> </ul>
QoS	<ul style="list-style-type: none"> <li>Riverbed® Deployment Guide v9.0 – Chapter 6: QoS Configuration and Integration and Chapter 7: QoS Configuration Examples</li> </ul>
Data Streamlining, Transport Streamlining, Application Streamlining, Management Streamlining	<ul style="list-style-type: none"> <li>Riverbed® Deployment Guide v9.0 – Section 1: Optimization Techniques and Design Fundamentals</li> </ul>
Security	<ul style="list-style-type: none"> <li>Riverbed® Deployment Guide v9.0 – Chapter 16: VPN Routing and Forwarding</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 18: Data Protection Deployments</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 20: Proxy File Services Deployment</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 22: Authentication, Security, Operations, and Monitoring</li> <li>SteelHead® Appliance Deployment Guide v9.0 – Protocols – Chapter 11: SSL Deployments</li> </ul>

## SteelHead, SteelHead EX

Subject	Reference
SteelHead® Appliance (Installation and Configuration)	<ul style="list-style-type: none"> <li>SteelHead® Appliance Installation and Configuration Guide</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 1: Optimization techniques and Design Fundamentals</li> <li>Riverbed Deployment Guide v9.0 – Chapter 3: WAN Visibility Modes</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 9: Physical In-Path Deployments</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 10: Virtual In-Path Deployments</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 17: Out-of-Path Deployments</li> <li>Riverbed® Deployment Guide v9.0 – Chapter 18: Data Protection Deployments</li> <li>Riverbed® Deployment Guide v9.0 - Protocols – Chapter 9: Video Optimization</li> <li>SteelHead® Appliance Deployment Guide v9.0 – Protocols</li> </ul>



	<ul style="list-style-type: none"> <li>• Riverbed Getting Started Guide v8.6</li> <li>• SteelHead Series EX560 and EX760 Systems Owner’s Manual v3.5.0</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN310 Optimizing Enterprise Applications and Protocols, WAN350 Implementing Enterprise Optimization Architectures</li> </ul>
SteelHead™ (virtual edition) (Installation and Configuration)	<ul style="list-style-type: none"> <li>• Virtual Steelhead™ Installation Guide v9.0</li> </ul>
SteelHead® Mobile Appliance (Installation and Configuration)	<ul style="list-style-type: none"> <li>• Riverbed® Deployment Guide v9.0 – Chapter 24: Steelhead Mobile Deployments</li> <li>• Steelhead® Mobile Controller User’s Guide v4.5.1</li> <li>• Steelhead® Mobile Controller Installation Guide v4.5.1</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN310 Optimizing Enterprise Applications and Protocols, WAN350 Implementing Enterprise Optimization Architectures</li> </ul>

### Interceptor

Subject	Reference
SteelHead™ Interceptor (Installation and Configuration)	<ul style="list-style-type: none"> <li>• Riverbed® Deployment Guide v9.0 – Chapter 18: Data Protection Deployments</li> <li>• Interceptor Appliance Deployment Guide v4.0.1</li> <li>• Interceptor® Appliance Installation Guide v4.0.1</li> <li>• Interceptor® Appliance User’s Guide v4.0.1</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN310 Optimizing Enterprise Applications and Protocols, WAN350 Implementing Enterprise Optimization Architectures</li> </ul>

### SteelCentral™ Controller for SteelHead

Subject	Reference
Controller Appliance (Installation and Configuration)	<ul style="list-style-type: none"> <li>• Riverbed® SteelCentral Controller for SteelHead Deployment Guide v9.0 –</li> <li>• SteelCentral Controller for SteelHead User’s Guide v9.0</li> <li>• SteelCentral Controller for SteelHead Installation Guide v9.0</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN350 Implementing Enterprise Optimization Architectures</li> </ul>
Controller-v Appliance	<ul style="list-style-type: none"> <li>• SteelCentral Controller for SteelHead Virtual Edition Installation Guide v9.0</li> </ul>

(Installation and Configuration)	
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## Case Studies

Subject	Reference
Case Studies, Design; Implementation, Configuration	<ul style="list-style-type: none"> <li>• Steelhead® Appliance Installation and Configuration Guide</li> <li>• Interceptor Appliance Deployment Guide v4.0.1</li> <li>• Riverbed® Deployment Guide v9.0 – Chapter 1: Optimization techniques and Design Fundamentals</li> <li>• Riverbed® Deployment Guide v9.0 – Chapter 19: Troubleshooting Steelhead Appliance Deployments Problems</li> <li>• Riverbed® Deployment Guide v9.0 – Chapter 20: Central Management Console Deployments</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN310 Optimizing Enterprise Applications and Protocols, WAN350 Implementing Enterprise Optimization Architectures</li> </ul>

## Troubleshooting

Subject	Reference
Troubleshooting	<ul style="list-style-type: none"> <li>• Riverbed® Deployment Guide v9.0 – Chapter 23: Troubleshooting Steelhead Appliance Deployments Problems</li> <li>• Riverbed® Training Course: WAN200 Optimization Essentials, WAN310 Optimizing Enterprise Applications and Protocols, WAN350 Implementing Enterprise Optimization Architectures</li> <li>• Riverbed® Knowledge Base Articles</li> </ul>

## Exam Question Distribution

<b>Subject Area</b>	<b>Approximate Number of Questions from this area</b>
SteelHead Deployment & SteelHead Controller for SteelHead	15
SteelHead Application Features	8
SteelHead Mobile Client	7
SteelHead Interceptor	4
SteelHead Networking Features	2
SteelHead SaaS	4
WAN Optimization Technology	20

## Exam Questions

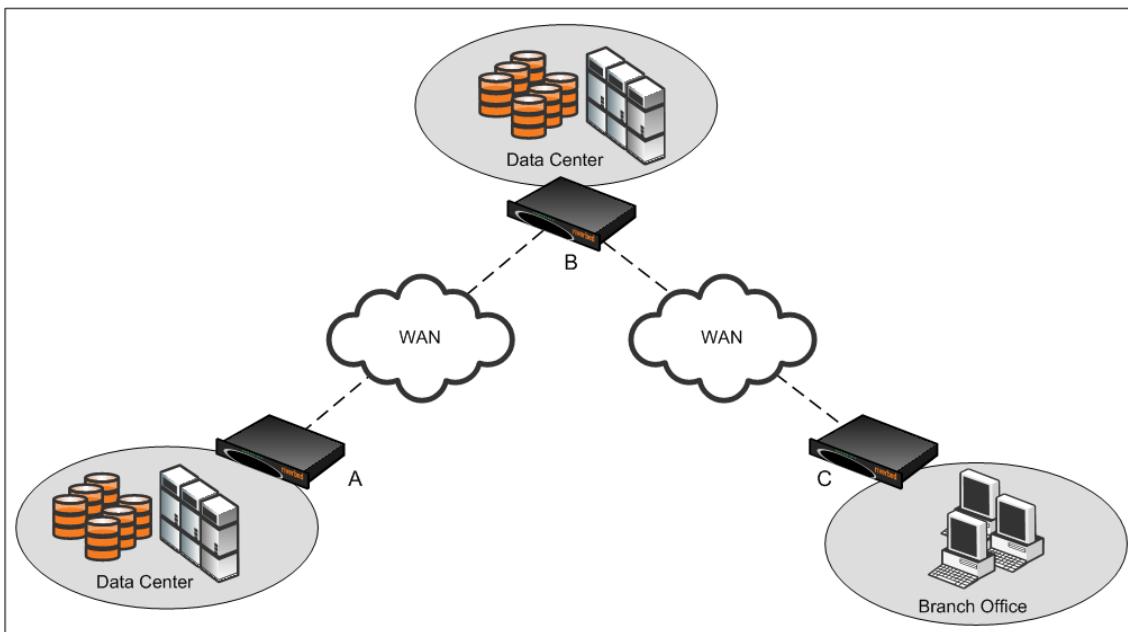
### Types of Questions

The RCSP-W exam includes a variety of question types, including single-answer multiple choice, multiple-answer multiple choice, drag and drop, scenario based, and fill in the blank. The question distribution is heavily targeted toward the multiple-choice variety. Regardless of the type of question, selecting the best answer(s) in response to the questions will yield the best score. **NOTE:** these are sample questions only, may refer to older product names or versions, and do not appear as actual exam questions.

### Sample Questions

1. You can monitor SteelHead disk performance using which reports? (Select 2)
  - a. Data Store Cost
  - b. Data Store Performance
  - c. Data Store Disk Load
  - d. SDR Hit
  - e. Disk Pressure
  - f. Disk Alarm
  
2. When upgrading SteelHead™ (virtual edition), what steps can be taken to preserve the existing data store?
  - a. When upgrading SteelHead™ (virtual edition), it is not possible to preserve the existing data store.
  - b. Detach the existing data store and re-attach to the new SteelHead™ (virtual edition).
  - c. Run vMotion and move the data store to a different ESX host before performing the upgrade and then bring it back afterwards.
  - d. Move the existing data store to an NFS share and move it back after the upgrade.
  
3. The primary data center Interceptor is configured to fail-to-block. What best describes the result of stopping the Interceptor service?
  - a. All traffic passes through the Interceptor.
  - b. Interceptor allows UDP traffic to pass-through, but blocks all TCP traffic.
  - c. Previously optimized connections continue to be redirected, but new TCP connections are passed through.
  - d. Interceptor communicates to SteelHead to disable their optimization service.

4. Refer to the exhibit. In order to achieve optimization using auto-discovery for traffic coming from site C and destined to site A in the exhibit, which configuration below would be required?
- In-path fixed-target rule on site B SteelHead pointing to Site A SteelHead
  - Peering rule on site B SteelHead passing through probes from site C
  - Peering rule on site B SteelHead passing through probe responses from site A
  - Both A and C
  - Both B and C



5. Which of the following best describes the way a CMC appliance policy can be created?
- By creating new policies through the CLI.
  - Policies can be created either manually, by the way of a configuration fetch from a Steelhead appliance, or by copying another policy.
  - By copying from a text file.
  - Policies can only be created manually.

6. Refer to the exhibit. A SteelHead administrator is troubleshooting a TCP connection. He wants to find out if the branch SteelHead is attempting to optimize a specific TCP connection. His first step is to collect the TCP dump. For some reason, the administrator is not being successful on his attempt to troubleshoot and find the problem. What could be the reason? (Select 3)
- This may be a pre-existing connection
  - The data center SteelHead is not ready to receive new connections
  - The administrator is collecting the tcpdump on the wrong SH interface
  - The destination IP device (server) is not ready to receive new connections
  - The administrator needs to collect a tcpdump on another SH interface

#### TCP Dumps Currently Running:

▼ Add a New TCP Dump
← Stop Selected Captures

**Name**

Capture Name:

**Endpoints**

*Capture traffic between:*

IPs:

Ports:

*and:*

IPs:

Ports:

**Capture Interfaces**

All Interfaces

**Base Interfaces:**    **In-Path Interfaces:**

primary             lan0\_0

aux                     wan0\_0

**Capture Parameters**

Capture Duration:  seconds

Maximum Capture Size:  MB

Buffer Size:  kB

Snap Length:  bytes

Number of Files to Rotate:

Only Capture VLAN-Tagged Traffic:

Custom Flags:

7. You have an existing Steelhead appliance deployment, which is achieving excellent optimization at five sites. You have deployed a SteelHead physically in-path at a new small branch office and all of your applications, both optimized and unoptimized, have become slower for this new branch office only. What is the likely cause?
- a. Incorrect in-path rules at the data center.
  - b. Incorrect in-path rules at the new branch office.
  - c. Duplex mismatch between the new branch SteelHead and a connected device.
  - d. Duplex mismatch between the data center SteelHead and a connected device.
  - e. Incorrect peering rules at the data-center.
  - f. Incorrect peering rules at the new branch office.
8. You have an existing SteelHead deployment, which is achieving excellent optimization at five sites. You have deployed a SteelHead physically in-path at a new small branch office and many of the new branch office users' applications are unoptimized; however some of the new branch office users' access to the same applications are optimized. Which of the following are possible causes? (Select 2)
- a. Duplex mismatch between the new branch office SteelHead and a connected device.
  - b. Duplex mismatch between the data center SteelHead and a connected device.
  - c. Network asymmetry.
  - d. The SteelHead is in admission control.
  - e. Overloaded servers.
9. What is the primary purpose of connection forwarding in WCCP deployments with multiple SteelHead in a single cluster? (Select 2)
- a. For handling removal query process.
  - b. For handling redirect assignment process.
  - c. For handling Here-I-Am packets process.
  - d. For handling the I-See-U packets process.
  - e. Connection forwarding is not recommend in WCCP deployments.

10. RiOS v7.0 and later versions provide the following ways to recognize, prioritize, encrypt, and optimize Citrix traffic: (select 4)
- a. Optimize the native ICA traffic bandwidth.
  - b. Auto-discovery of Citrix port 1449 with Interceptor appliance.
  - c. Classify and shape Citrix traffic using QoS.
  - d. Citrix directory server pre-population.
  - e. Optimize Citrix ICA-over-SSL.
  - f. Optimize client drive mapping (CDM).

**Answers**

1: a and c; 2: a; 3: d; 4: b; 5: b; 6: a, c and e; 7: c; 8: c and d; 9: a and b; 10: a, c, e and f.