

riverbed

Think fast.™

Riverbed Certified Solutions Professional – Network Performance Management - NPM (RCSP-NPM)

Exam 299-01

COPYRIGHT © 2013 Riverbed Technology, Inc.

ALL RIGHTS RESERVED

All content in this blueprint, including text, graphics, logos, icons, and images, is the exclusive property of Riverbed Technology, Inc. (“Riverbed”) and is protected by U.S. and international copyright laws. The compilation (meaning the collection, arrangement, and assembly) of all content in this manual is the exclusive property of Riverbed and is also protected by U.S. and international copyright laws. The content in this blueprint may be used as a resource. Any other use, including the reproduction, modification, distribution, transmission, republication, display, or performance, of the content in this manual is strictly prohibited.

TRADEMARKS

RIVERBED TECHNOLOGY, RIVERBED, STEELHEAD, VIRTUAL STEELHEAD, RiOS, INTERCEPTOR, THINK FAST, the Riverbed logo, MAZU, PROFILER, CASCADE, CASCADE PILOT, SHARK, CACE TECHNOLOGIES, CACE PILOT, TURBOCAP, WINPCAP, AIRPCAP, WIRESHARK, STINGRAY, GRANITE and WHITEWATER are trademarks or registered trademarks of Riverbed. The trademarks and logos used in this blueprint may not be used without the prior written consent of Riverbed or their respective owners.

PATENTS

Portions, features and/or functionality of Riverbed's products are protected under Riverbed patents, as well as patents pending.

DISCLAIMER

THIS BLUEPRINT IS PROVIDED BY RIVERBED ON AN "AS IS" BASIS. RIVERBED MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE INFORMATION, CONTENT, MATERIALS, OR PRODUCTS INCLUDED OR REFERENCED IN THE BLUEPRINT. TO THE FULL EXTENT PERMISSIBLE BY APPLICABLE LAW, RIVERBED DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.

Although Riverbed has attempted to provide accurate information in this blueprint, Riverbed assumes no responsibility for the accuracy or completeness of the information. Riverbed may change the programs or products mentioned in this blueprint at any time without notice, but Riverbed makes no commitment to update the programs or products mentioned in this blueprint in any respect. Mention of non-Riverbed products or services is for information purposes only and constitutes neither an endorsement nor a recommendation.

RIVERBED WILL NOT BE LIABLE UNDER ANY THEORY OF LAW, FOR ANY INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, BUSINESS INTERRUPTION, LOSS OF INFORMATION OR DATA OR COSTS OF REPLACEMENT GOODS, ARISING OUT OF THE USE OR INABILITY TO USE THIS BLUEPRINT OR ANY RIVERBED PRODUCT OR RESULTING FROM USE OF OR RELIANCE ON THE INFORMATION PRESENT, EVEN IF RIVERBED MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

CONFIDENTIAL INFORMATION

The information in this blueprint is considered Confidential Information (as defined in the Reseller Agreement entered with Riverbed or in the Riverbed License Agreement currently available at www.riverbed.com/license, as applicable).

Table of Contents

Table of Contents	2
Preface	3
Certification Overview	3
Benefits of Certification	3
Exam Information	4
Certification Checklist	4
Recommended Resources for Study	5
RIVERBED CERTIFIED SOLUTIONS PROFESSIONAL – NPM (RCSP-NPM) BLUEPRINT AND STUDY REFERENCES	6
General Knowledge	6
Cascade Profiler	7
Cascade Pilot	7
Cascade Shark	7
Exam Questions	8
Types of Questions	8

Preface

This Riverbed® Certification Blueprint is intended for anyone who wants to become certified in the Riverbed Network Performance Management - NPM products and Riverbed Cascade®. The Riverbed Certified Solutions Professional – NPM (RCSP-NPM) program is designed to validate the skills required of technical professionals who can demonstrate strong knowledge in the theory, configuration, implementation, and troubleshooting of the Riverbed Cascade product solutions in a complex network environment.

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 – NPM certification is granted to individuals who demonstrate advanced knowledge and experience with the Riverbed Cascade product suite. The typical RCSP-NPM will have taken a Riverbed approved training class such as the *NPM200 Performance Monitoring Essentials* course in addition to having hands-on experience in performing deployment, troubleshooting, and maintenance of Riverbed Cascade 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 Riverbed Optimization System (RiOS®) products and Cascade 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-NPM 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 Cascade products and services.
2. May help improve your career advancement potential.
3. Entitles you to use the RCSP-NPM 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:** 299-01
- **Exam Name:** Riverbed Certified Solutions Professional – NPM
- **Cascade Version:** Up to version 10.0 for the Cascade Profiler, Express, Sensor and Gateway; version 10.0 for Cascade Pilot; version 10.0 for Cascade Shark and vShark, and version 10.0 for Cascade Express 460.
- **Number of Questions:** 65
- **Total Time:** 75 minutes for exam, 15 minutes for Survey and Tutorial (90 minutes total)
- **Exam Provider:** Pearson VUE
- **Exam Language:** English and Japanese only. Riverbed allows a 30-minute time extension for English 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. There will be no time extension for candidates taking the exam in Japanese.
- **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 test centers in 165 countries)
- **Prerequisites:** None (although taking a Riverbed training class is highly recommended)
- **Available to:** Everyone (partners, customers, and employees)
- **Passing Score:** 700 out of 1000 (70%)
- **Certification Expires:** Every two years (must recertify every two years, with six month grace period)
- **Recertification Criteria:** Retake the 299-01 – RCSP-NPM current exam. If you are a RCSP-NPM certified, retaking the 299-01 – RCSP-NPM exam will also re-certify your RCSP-NPM.
- **Wait Between Failed Attempts:** 72 hours
- **Wait Between Passed Exams:** One year. This will be effective starting March 12, 2011.
- **Cost:** \$225.00 (USD)
- **Number of Attempts Allowed:** Unlimited (though statistics are kept)

Certification Checklist

As the RCSP-NPM exam is geared towards individuals who have both the theoretical knowledge and hands on experience with the Riverbed Cascade 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 Riverbed Cascade 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-NPM 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-NPM 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>.

Recommended Resources for Study

Riverbed Training Course

- NPM200 Performance Monitoring Essentials

Additional Information on Riverbed Training can be found at: <http://riverbeduniversity.com> or <http://www.riverbed.com/services-training/training/>. You can also write to training@riverbed.com or university@riverbed.com.

RIVERBED CERTIFIED SOLUTIONS PROFESSIONAL – NPM (RCSP-NPM) BLUEPRINT AND STUDY REFERENCES

The Riverbed Certified Solutions Professional exam, and therefore this blueprint, covers the Riverbed products and technologies through version 10.0 for the Cascade Profiler, Express, Sensor and Gateway; version 10.0 for Cascade Pilot; version 10.0 for Cascade Shark and vShark, and version 10.0 for Cascade Express 460.

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 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	http://www.ietf.org/rfc.html <ul style="list-style-type: none"> • RFC 793 (Original TCP RFC) • RFC 1323 TCP extensions for high performance • RFC 2474 (Differentiated Services Code Point) • RFC 4789 (Simple Network Management Protocol – SNMP) • RFC References for DNS http://www.zoneedit.com/doc/rfc/ TCP/IP Illustrated, Volume I, The Protocols by W. R. Stevens (Addison-Wesley, 1994)
Spanning Tree Protocol	<ul style="list-style-type: none"> • http://en.wikipedia.org/wiki/Spanning_Tree_Protocol Interconnections: Bridges, Routers, Switches and Internetworking Protocols, Second Edition, by Radia Perlman (Addison-Wesley Professional, 1999)
NetFlow	http://www.caida.org/tools/utilities/flowsan/arch.xml

Cascade Profiler

Subject	Reference
Cascade Profiler, Pilot, Sensor, Gateway, Express	<ul style="list-style-type: none"> Riverbed® Cascade® Product Suite Deployment Guide v10.0.7 Cascade Sensor™ and Cascade Gateway™ User's Guide v9.0.5 Cascade Profiler and Cascade Express™ User's Guide v9.0.5 Cascade Sensor and Cascade Gateway™ User's Guide v9.0.5 Riverbed® Training Course: Cascade Configuration & Operation

Cascade Pilot

Subject	Reference
Installation, Configuration, Operation, Reporting, Analytics, Network Evaluation, Deployment, Sizing	<ul style="list-style-type: none"> Riverbed® Cascade® Product Suite Deployment Guide v10.0.7 Cascade Pilot Personal Edition Reference Manual v10.0.7 Cascade Pilot Reference Manual v10.0.7 Riverbed® Training Course: NPM200 Performance Monitoring Essentials

Cascade Shark

Subject	Reference
Installation, Configuration, Operation, Sizing, Analytics, Monitoring, Deployment	<ul style="list-style-type: none"> Riverbed® Cascade® Product Suite Deployment Guide v10.0.7 Cascade Shark Quick Start Guide v10.0.7 Cascade Shark Appliance Maintenance Guide v10.0.7 Cascade Shark Filters Guide v10.0.7 Cascade Shark REST API Documentation v10.0.7 Cascade Shark User's Guide v10.0.7 Cascade Virtual Shark Quick Start Guide v10.0.7 Riverbed Cascade Shark Common REST API Documentation v10.0.7 Riverbed® Training Course: NPM200 Performance Monitoring Essentials

Exam Questions

Types of Questions

The RSCP-NPM exam includes a variety of question types, including single-answer multiple choice, multiple-answer multiple choice, drag and drop, and fill in the blank. The question distribution is heavily targeted toward the multiple-choice variety, however, fill in the blank questions are used in situations where the command is believed to be important part of everyday Cascade appliance operation. Regardless of the type of question, selecting the best answer(s) in response the questions will yield the best score.

Sample Questions

1. In Cascade Profiler version 9.6 and greater, stronger access security was put in place. What are the three selectable options available for shell access to the Profiler?
 - a. Disabled, Enabled, Challenge Mode
 - b. Encrypted, Unencrypted, Password-protected with encryption
 - c. SSLv1, SSLv2, SSLv3/TLS
 - d. SSHv1, SSHv2, SSHv3
 - e. SHA, AES-128, AES-256
2. Which of the following are true about the Cascade Profiler REST API? (Select 2)
 - a. It is an API that relies on an ODBC connector.
 - b. It can be used directly or through Riverbed FlyScript.
 - c. All Request and Response data is in CSV format.
 - d. Request formats includes XML and JSON data.
 - e. It requires an additional software developers kit license.
3. What capabilities does Cascade support with respect to VXLAN? (Select 3)
 - a. None, VXLAN traffic is only reported as UDP traffic.
 - b. Cascade extracts VXLAN data from enhanced IPFIX flow data from VMware infrastructure.
 - c. VXLAN tunnel is decoded to identify the underlying virtualized infrastructure.
 - d. Cascade Pilot can decode VXLAN sessions to view the encapsulated sessions.
 - e. Cascade can be used to configure Virtual Tunnel End Points in a VXLAN environment.
4. Which of the below statements are true about VoIP reporting on Cascade Profiler? (Select 2)
 - a. CascadeFlow from the Steelhead(s) is required.
 - b. Flow export from Cascade Shark(s) with VoIP export enabled is required.
 - c. Only bit-rate and packet-rate information can be reported since statistics such as RTP packet loss and MOS scores aren't included in standard flow protocols.
 - d. MOS Scores and RTP Packet loss can be reported with proper instrumentation.
 - e. NBAR can be used as an export mechanism for required statistics.

5. Microburst views in Pilot allow burst analysis at what level of granularity?
 - a. Nanosecond
 - b. Microsecond
 - c. Millisecond
 - d. Second

6. Cascade Pilot provides layer-7 protocol decodes for which of the following protocols? (Select 3)
 - a. SMBv1
 - b. SMBv2
 - c. Citrix
 - d. NFS
 - e. SAP

7. The CIFS views within Cascade Pilot can be used to: (Select 3)
 - a. Analyze CIFS performance by Request, File or Command
 - b. Analyze CIFS encryption algorithm errors
 - c. Analyze CIFS interactions with SQL
 - d. Analyze CIFS errors by Request
 - e. Analyze CIFS OpLlock levels

8. In Cascade Shark appliance, what are available options for exporting flow to the Profiler? (Select 3)
 - a. Enabling flow export per capture job
 - b. Enabling flow export per capture port
 - c. Enabling export of packet payload
 - d. Enabling export of VoIP metrics
 - e. Filtering flow export using a BPF filter
 - f. Enabling export of MAC Address

9. Link Congestion policies apply to a specific interface and can: (Select 3)
 - a. Warn if either inbound or outbound traffic increases abnormally
 - b. Warn if an application component of traffic increases abnormally
 - c. Warn if traffic to/from specific hosts exceeds a specific utilization level
 - d. Warn if the response time across a link increases abnormally

10. A SPAN port is often limited in which way:

- a. Can only capture traffic from a single port
- b. Can only capture traffic that is routed (not switched)
- c. Can only capture traffic that is ingress or received by the device
- d. The number that can be configured is oftentimes limited to two
- e. Requires at least two monitoring ports to capture a single link

Answers

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