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A decorative background featuring a grid of rounded squares in shades of yellow and orange. Overlaid on this grid are several large, semi-transparent orange arrows pointing to the right, creating a sense of forward motion and progress.

# Economic Value Validation

## Riverbed Performance Management - Cascade

June 2013

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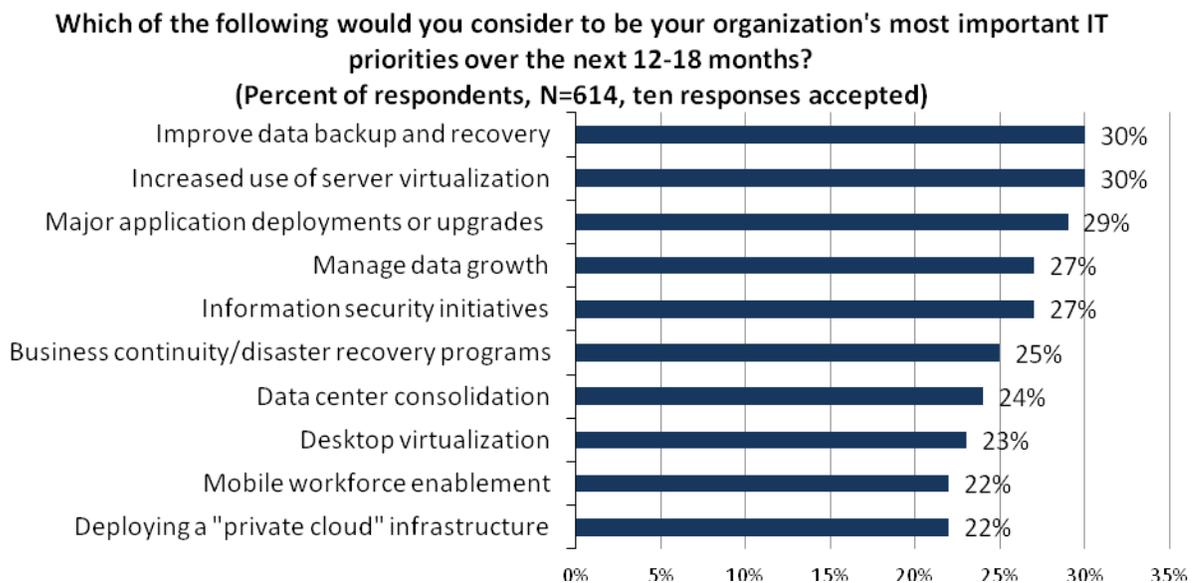
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## Market Overview

Organizations are rapidly transforming their data center environments to better handle the requirements of the business in a global marketplace. A big part of this transformation involves consolidating data centers, increasing the use of virtualization technologies, and implementing private and public cloud environments.

ESG research validates these trends, as seen in Figure 1. Organizations have reported increasing use of server virtualization as a top IT priority for the last four years. Data center consolidation has also been consistently among the top ten most important IT priorities reported by respondents as organizations look to reduce the number of regional data centers and build out larger, more powerful mega data centers. Add to that mix modular web or service-oriented architecture (SOA)-based application architectures that are heavily dependent on the network, and it quickly becomes apparent that the network is becoming far more important to the business and much more complex.

Figure 1. Top Ten Most Important IT Priorities



Source: Enterprise Strategy Group, 2013.

As these network environments scale and become more complex, network operations teams struggle to keep pace.

Simply trying to ensure availability and troubleshoot problems are becoming major time and resource drains. According to ESG research on 2013 IT spending plans, organizations reportedly expect to spend 64% of their budgets on managing and maintaining their IT environments and only 36% of their budget on innovative new technologies—it is clear there needs to be a change.<sup>1</sup> While new network architectures like software-defined networking hold significant promise for the future, the reality is that organizations are struggling to effectively manage operations today. Only by having greater visibility into these rapidly growing network environments can operations teams begin to better manage them.

In the same study, network teams were asked to specify their most important network priorities for 2013—network management solutions was the second most popular response provided by respondents after network security.<sup>2</sup> Clearly, there is a demand for network management solutions that can help organizations more proactively manage a rapidly growing and increasingly complex network environment. Comprehensive solutions will enable operations teams to dramatically reduce troubleshooting times and mitigate the risk of outages caused by the network, ensuring higher levels of productivity and increased revenues. [Riverbed Technology](#) is one such vendor providing comprehensive network management (NPM) with its Riverbed Cascade NPM solution and is the focus of this ESG economic value validation (EVV) report.

<sup>1</sup> Source: ESG Research Report, [2013 IT Spending Intentions Survey](#), January 2013.

<sup>2</sup> Source: ESG Research Brief, [2013 Network Spending Trends](#), March 2013.

## Riverbed Cascade: Customer Benefits

ESG interviewed current Riverbed Cascade customers in order to better understand the existing usage and benefits of the Cascade solution, and to inform and validate the assumptions used in ESG’s EVV analysis. Based on these interviews, ESG concludes that the benefits of deploying a Riverbed Cascade solution are numerous and diverse. ESG’s findings with respect to customer benefits are incorporated into and, in turn, presented quantitatively in the EVV results presented later in this report, but they are also summarized qualitatively—in many cases in the customers’ own words—in this section.

### Customer Benefits Overview:

- Faster troubleshooting
- Increased IT efficiencies
- More effective planning for change
- Proactive monitoring
- Detailed reporting

### Faster, More Effective, Troubleshooting

Virtually every modern business operates in an “always on” mode that requires 24x7 forever availability. As such, when there is an outage, it is critically important to be able to find and fix the source of the problem as quickly as possible. This requires organizations to abandon the legacy “phone call” from users reporting a problem in favor of a far more proactive approach that rapidly isolates and remediates acute and chronic problems.

The Riverbed customers ESG interviewed had numerous examples of how the Cascade solutions helped to accelerate problem resolution. One organization we spoke to had previously leveraged the telephone alert system and manually investigated outages.

*“Prior to Cascade, it would take our network team hours or even days just to find the problem. Even worse, sometimes the problem would resolve itself before we even found it. Since deploying Cascade, the network team is quickly alerted to problems, reports are generated, and we are able to identify the problem in less than ten minutes.”*

Another customer reported:

*“Without Cascade we had a number of people involved in the troubleshooting process and it typically took a full day to find the problem. Now there is only one person involved and we have the problem identified and fixed in under an hour.”*

A large financial customer reported the benefits of modeling the performance and having visibility:

*“We had two events recently, the first was before Cascade, and it was impacting all users and took us six hours to find the root cause. In the second event, Cascade had been deployed, we were able to instantly identify the problem and fix it within two minutes. By the time the phone rang, we were able to inform our boss that we had identified the abnormal behavior and impacted servers and routers and had taken action to correct the problem.”*

### Increased IT Efficiencies

Ask any network operations staff member if she would like to have more time in a day and you will receive an emphatic “yes.” Employees are typically so busy just handling routine, day-to-day tasks that it is difficult for them to get to more strategic projects. By reducing the time to complete mundane tasks like report generation, organizations can gain back valuable time. Riverbed Cascade customers reported gaining significant efficiencies when leveraging Cascade solutions:

*“It is difficult for large scale organizations to mine data as it becomes prohibitively expensive. While the actual content may be simple,...when the organization size is big (i.e., millions of flows per minute), obtaining results immediately and not having to wait three to four hours for a report is invaluable.”*

*“No more fire drills at 2PM in afternoon, where all our admins go looking for something. We are now able to manage a larger, more complex environment with fewer people.”*

**More Effective Planning for Change**

In addition, organizations were able to plan future environments more effectively. Another Riverbed Cascade customer interviewed by ESG also stated:

*“Before we commenced a server virtualization initiative, the network team was able to model the performance requirements for existing applications and demonstrate that a network upgrade (1 to 10 GbE) was required in order to meet or exceed SLAs. This pre-work ensured a smooth transition between the physical and virtual environments.”*

These upgrades are not unusual; unfortunately, many times they only come after or halfway through a server virtualization initiative due to performance issues uncovered after the fact. For those organizations with Riverbed solutions, the need for those upgrades can be proven ahead of time, eliminating numerous performance issues, finger pointing sessions, and emergency upgrades to complete a server virtualization roll out.

Another customer reported:

*“Riverbed Cascade changed how I spent money. It changed our capital forecast. We definitely use it as our ‘trust but verify’ tool.”*

**Proactive Monitoring**

As the network operations staff fully understands the data collection and ability to analyze historical data, Riverbed Cascade will enable them to leverage automated thresholds which recognize normal and abnormal traffic variations. As thresholds are reached when traffic exceeds expectations, Cascade raises alerts so managers can proactively fix performance issues before an outage occurs. Several organizations we spoke to were taking advantage of proactive monitoring.

*“I like to periodically run a scan on the whole network. I will usually find some minor issues just doing that and can quickly correct them before they turn into a bigger problem.”*

*“A proactive approach is a top priority for us as we cannot afford any downtime and need to find and fix problems in real time.”*

**Detailed Reporting**

The ability to provide detailed reports and analytics will enable organizations to make more educated decisions about the network. This may also play an important role in highly virtualized, multi-tenant environments, where detailed chargeback is required or visibility into private virtual data centers is needed. In addition, by working with VMware and integrating with vSphere 5.1, the Riverbed Cascade solution will provide end-to-end visibility across physical or virtual environments, including those with VXLAN overlay networks. Riverbed customers report the following benefits:

*“One of the top benefits we get from Riverbed is the application analytics that help us determine if a specific tier of code or application module or the network is the culprit. Reports to application teams points out the root cause. Other organizations were surprised by the amount and type of data that was available to us. It has enabled us to regain control and credibility in our organization. We are like CSI for Network Operations.”*

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Clearly, numerous benefits are associated with deploying network performance management solutions such as Riverbed Cascade. The economic value of these benefits will be discussed in the remainder of this paper.

## Riverbed Cascade: Economic Value Validation

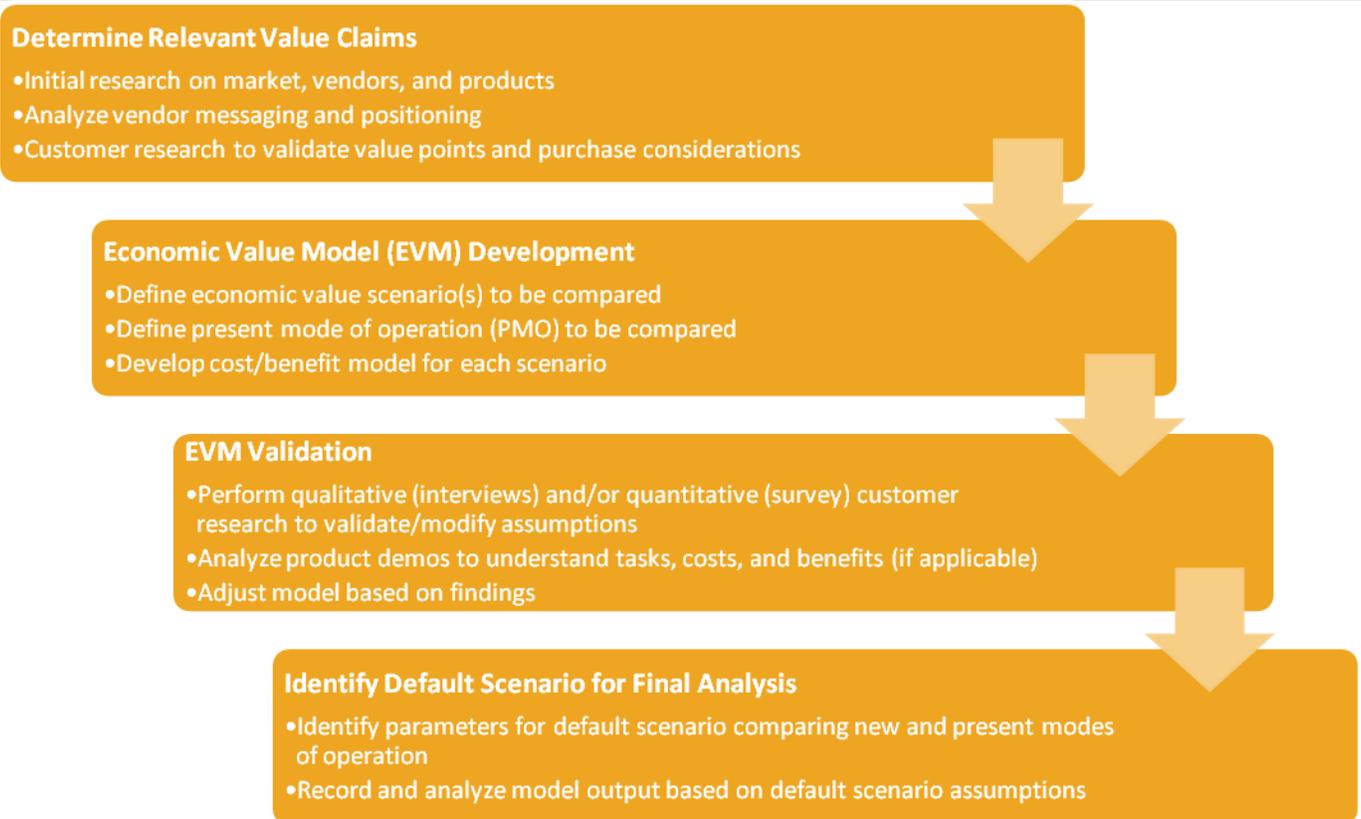
### Objective

ESG was engaged by Riverbed to develop a detailed EVV analysis designed to help IT organizations determine the relative costs and benefits of deploying Riverbed Cascade compared with a typical performance management solution. This EVV analysis builds upon in-depth interviews with Cascade customers and other IT professionals, additional ESG market research on network performance management solutions, and ESG’s familiarity with the myriad of alternative performance management solutions available in the market today. This analysis is designed to provide potential customers with a comprehensive picture of the direct and indirect costs and benefits they should consider when evaluating Riverbed Cascade to deploy a new network performance management solution.

### Methodology

For this project, ESG followed its standard, four-phase EVV methodology, depicted in Figure 2. Please see Appendix A for full methodology details.

Figure 2. ESG EVV Methodology



Source: Enterprise Strategy Group, 2013.

Please note that the data and conclusions presented in this report regarding the costs and benefits associated with implementing Riverbed Cascade versus a typical network performance management solution reflect the output of ESG’s economic value analysis based on the specific use case and default scenario assumptions modeled specifically for this report. ESG acknowledges that changes to these assumptions will lead to a different set of results and as such, advises IT professionals to use this report as one validation point in a comprehensive financial analysis process prior to making a purchase decision. Pricing assumptions for Riverbed Cascade were provided to ESG by Riverbed. Other IT equipment and labor cost assumptions were obtained from publicly available sources such as IT vendor websites and published price lists. ESG acknowledges that list prices, configuration details, or other data used as inputs may vary depending on the source of this information.

## Economic Value Model Overview

As previously noted, ESG's Economic Value Validation (EVV) compares two scenarios: The first is an organization that elects to use Riverbed Cascade for performance management requirements; the second scenario is a "present mode of operation" (PMO) that reflects the traditional approach that most customers currently take to meet their performance management requirements. The basic profile for each scenario is included below:

- **"Riverbed Cascade" scenario:** In this scenario, the customer is using Riverbed Cascade for network performance management. The Cascade configuration includes a combination of the following components: Profiler, Gateway, Pilot, Shark, and Steelhead. The model takes into account all hardware, software, and data center infrastructure costs associated with the Cascade solution (see Appendix B), plus related IT labor costs for planning, design, implementation, ongoing administration, and training.
- **"Present Mode of Operation" (PMO) scenario:** In this scenario, the customer is using an alternative performance management solution which uses a combination of systems monitoring and management platforms, SNMP network monitoring tools, network diagramming and modeling tools, packet capture tools, network performance analysis tools, and integration with help desk software and SIEM solutions. The model takes into account all hardware, software, and data center infrastructure costs associated with this solution, plus related IT labor costs for planning, design, implementation, ongoing administration, and training.

The tasks and processes used as the basis of comparison for both scenarios include:

- Deployment tasks including the initial installation and setup, plus periodic upgrades and ongoing maintenance activities
- IT administration and network operations tasks such as initiating traffic data collection and ongoing filtering and monitoring of network traffic data
- IT administration and network operations tasks related to detecting and handling network issues, drilling down into network traffic data, analyzing network anomalies, and implementing corrective actions
- IT administration and network operations activities related to change management such as adding or changing network resources, application servers, and other infrastructure changes
- IT administration and network operations tasks for creating dashboard reports and generating periodic reports for management and application owners

*Note that because of the ownership and operation of the solutions over multiple years, ESG measured activities, additional capital purchases, and migrations required to grow and scale the solutions over time.*

Simply put, ESG's model estimates the likely cost and potential benefits of deploying and using performance management solutions according to the tasks outlined above for Riverbed Cascade and a PMO solution. Data sources used by ESG to inform and populate the assumptions regarding these tasks used in the model include in-depth interviews with current Riverbed customers and other IT professionals, product demos of the Cascade solution, and ancillary ESG market research data.

## Cost Categories

This ESG EVV considers six cost categories: hardware, software, infrastructure, professional services, staff, maintenance, and support. The sum of these categories equals the total cost of ownership (TCO) of each solution. See Appendix B for detailed cost categories.

## Benefit Categories

This ESG EVV considers two primary benefit categories: IT efficiency savings and user productivity improvements. The sum of these categories equals the total benefit of each solution. See Appendix B for detailed benefits categories.

## Economic Value Validation Results

### Example Scenarios

ESG developed a baseline profile of two generic organizations (one using Cascade, the other using a PMO solution) to illustrate the relative costs and benefits between the two. For the purposes of this analysis, ESG tuned its model assumptions to a default scenario consisting of a medium sized organization consisting of 25 remote locations, three primary data centers, and 25,000 endpoint devices.

Key assumptions used in ESG's default scenarios are displayed in Table 1.

*Table 1. Default Scenario Assumptions*

Input	Scenario Assumptions
Number of remote locations	25
Number of primary data centers	3
IP endpoints at start	25,000
Number of servers at start	2,500
Percent virtual servers	50%
Percent virtual servers monitored	25%
Number of applications	1,000
Number of critical apps	100
Number of users per critical app	500
Number of users - other apps	50

*Source: Enterprise Strategy Group, 2013.*

Based on ESG's interviews with Riverbed customers and product demonstrations, we believe these assumptions to be a reasonable starting point for analysis. However, those same interviews and data also suggest that in some cases, these underlying assumptions may be conservative. For example, in considering the impact of an outage, the cost of downtime does not represent damage to the company's brand, stock price, or any SLA penalties that may have to be paid as a result of the outage. All of these factors would have a significant impact on the net economic value of a Riverbed Cascade solution and, in ESG's model, would likely result in a higher positive ROI.

### Summary of Results

With the model parameters tuned to the default assumptions in Table 1, ESG's EVV analysis concludes that the net benefits of implementing Riverbed Cascade greatly outweigh the associated costs. Table 2 shows the annual return on investment (ROI), payback period, net present value (NPV), annual total cost of ownership (TCO), and annual benefit for Riverbed Cascade compared with an organization whose present mode of operation includes use of a typical performance management solution. The following section details the most compelling findings from this analysis as they relate to both the costs and benefits associated with network performance management.

*Table 2. Economic Value Summary, Riverbed vs. PMO*

Scenario	Annual ROI	Payback Period (months)	Net Present Value	Annual TCO	Annual Benefit
Riverbed Cascade	133%	14.6	\$408,256	\$292,903	\$683,623
PMO	-41%	60+	\$(684,196)	\$553,440	\$324,674

*Source: Enterprise Strategy Group, 2013.*

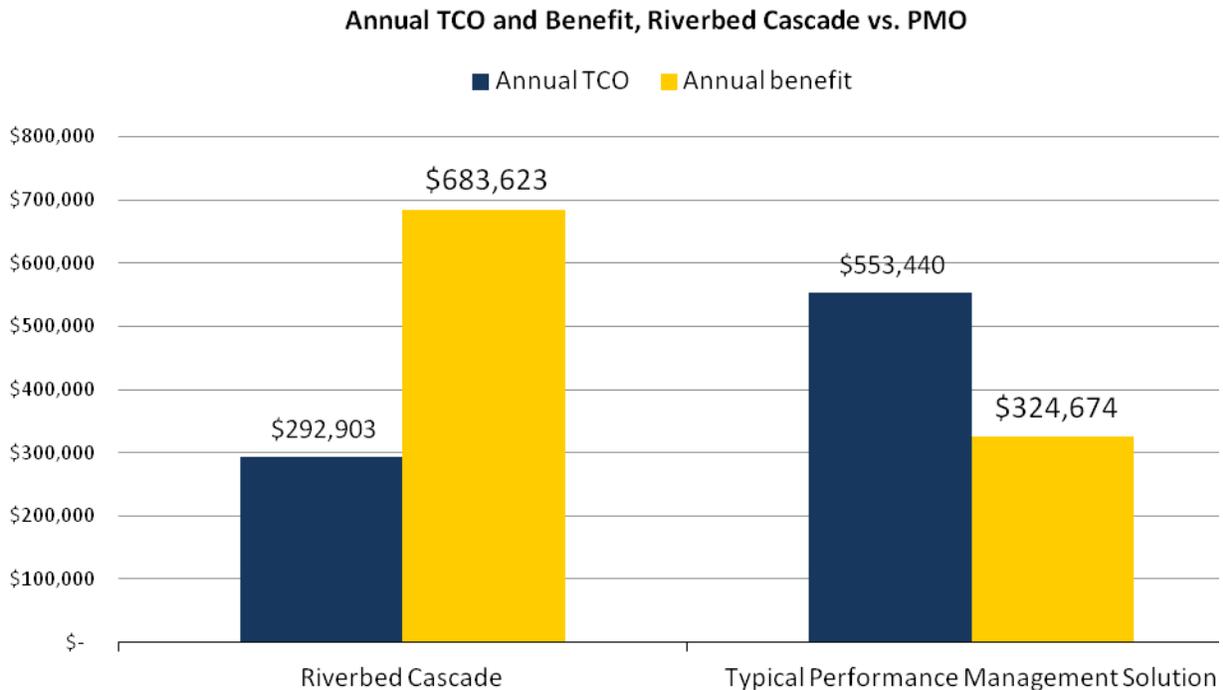
### Annual TCO

Annual TCO is the sum of all the cost categories included in the analysis averaged over three years. As displayed in Table 2, the annual TCO for Riverbed Cascade is \$292,903, compared with \$553,440 for the PMO solution. TCO should only be one part of the customer consideration, however, as the lower costs associated with Riverbed Cascade are augmented by significant benefits in the areas of improved user productivity and increased IT efficiency.

### Annual Benefit

Annual benefit is the sum of all the benefit categories included in this analysis averaged over three years. As displayed in Table 2, the annual benefit for Riverbed Cascade is \$683,623, compared with \$324,674 for the PMO solution. On both a three-year and annualized basis, the benefits of Riverbed significantly outweigh the costs. The annual cost and benefit for Riverbed versus a PMO solution are depicted graphically in Figure 3.

Figure 3. Annual TCO and Benefit, Riverbed vs. PMO



Source: Enterprise Strategy Group, 2013.

### ROI

ROI compares net benefits against total costs and helps makes sense of the cost and benefit figures in Figure 3. As displayed in Table 2, the annual ROI for the Riverbed Cascade solution in ESG’s default scenario is 133%. As previously discussed, the benefits achieved from increased user productivity (by dramatically reducing the time required to find and fix network outages) and IT efficiency (such as a reduction in the number of admins required to find a network performance problem as well as manage and maintain a larger more complex network environment) achieved with a Riverbed solution greatly offset costs, resulting in a positive return on investment.

### Payback Period

Payback period is an estimate of when customers will start to see a positive return from the network performance management solution they select. As displayed in Table 2, the payback period as modeled in our default scenario is estimated to be just over a year (14.6 months) compared to more than five years with the PMO solution.

### Net Present Value (NPV)

NPV is used to calculate the difference between the present value of cash returns and the present value of cash outflows. It assumes a discount rate to calculate the present value. As displayed in Table 2, the NPV for the Riverbed solution in the default scenario modeled by ESG is calculated at \$408,256. NPV is used as a decision-making tool: Projects with a positive NPV are generally considered to be worth the investment.

### TCO Analysis

For the hypothetical customer scenario described, the three-year cost of ownership for Riverbed Cascade compared to the PMO is displayed in Table 3.

As shown, the Riverbed solution is less expensive in both scenarios compared to alternative performance management solutions over a three-year period. ESG estimates that Cascade customers will realize significant cost advantages in the areas of hardware, software (especially with integrated reporting capabilities), and maintenance and support costs (due to the fewer hours required for solution design, install, and training).

Table 3. Three-year TCO Riverbed vs. PMO

Category	Riverbed Cascade	PMO
Hardware	\$ 475,944	\$ 644,410
Software	\$ 93,240	\$ 338,793
Infrastructure	\$ 2,800	\$ 19,500
Maintenance & Support	\$ 238,925	\$ 463,441
Professional Services	\$ 52,000	\$ 135,500
Staff	\$ 15,800	\$ 58,675
<b>Total Three-year Costs</b>	<b>\$ 878,709</b>	<b>\$ 1,660,319</b>

Source: Enterprise Strategy Group, 2013.

### Benefits Analysis

As previously discussed, cost is only one side of the equation when evaluating the true economic value of an IT product or service. Potential customers must also take into account the financial and operational benefits they will achieve from that technology solution. Three-year benefits for a Riverbed Cascade solution compared with a PMO solution are displayed in Table 4. As shown, total benefits for Riverbed Cascade (\$2,050,870) are over twice that of a PMO solution (\$974,023). For Riverbed Cascade, this situation results in a net-financial benefit (relative to costs) of \$1,858,456 over three years (see Table 5).

Table 4. Three-year Benefit, Riverbed vs. PMO

Category	Riverbed Cascade	PMO
IT Efficiency Savings	\$ 444,583	\$ 227,274
User Productivity	\$ 1,606,286	\$ 746,749
<b>Total Three-year Benefits</b>	<b>\$ 2,050,870</b>	<b>\$ 974,023</b>

Source: Enterprise Strategy Group, 2013.

Table 5. Three-year Net Financial Benefit, Riverbed Cascade

Category	Riverbed Cascade	PMO	Net Financial Benefit
Total Benefits	\$ 2,050,870	\$ 974,023	
Total Costs	\$ 878,709	\$ 1,660,319	
<b>Total Economic Value</b>	<b>\$ 1,172,161</b>	<b>\$ ( 686,296)</b>	<b>\$ 1,858,456</b>

Source: Enterprise Strategy Group, 2013.

As outlined earlier, ESG calculated potential benefits from both an IT-efficiency and a user-productivity perspective. While ESG estimates that Riverbed Cascade will result in nearly twice the IT efficiency benefits over typical performance management solutions, customers will see the majority of their economic benefits in the area of improved user productivity. Once again, this is the time saved by employees when Riverbed Cascade is used to speed application deployment, decrease disruptive network interruptions and performance degradation, and reduce application downtime and delays expressed in the financial value of that time. Over three years, 78% of the benefits derived from Riverbed Cascade (or \$1,606,286) come from these productivity gains.

ESG's interviews with Riverbed customers validated that Riverbed Cascade solutions improve network performance and availability management for end-users by enabling holistic, application aware network visibility. The ability to dramatically reduce the amount of time required to see and isolate a network problem was repeatedly highlighted as one of the top benefits described in customer interviews. Users stated that this not only helped to minimize the impact of an outage to the business, but it also enabled network operations teams to be more proactive in finding minor issues before causing a major outage. This has the added benefit of giving the network operations teams credibility, instead of always being blamed for problems—they are now able to pinpoint problems with a high degree of accuracy.

Reducing or eliminating network management, maintenance, and planning tasks can have a profound impact on IT. Respondents to ESG's annual IT spending intentions survey report that more than 50% of their budgets go toward staff (32%) and hardware (20%)—the two largest components of the average IT budget.<sup>3</sup> Leveraging comprehensive network performance management solutions that reduce the number of staff required or the amount of time IT staff is putting into troubleshooting and maintaining the existing infrastructure enables teams to redirect their time toward more strategic business-acceleration initiatives.

### Potential Areas for Additional Savings and Benefits with Riverbed Cascade and Steelhead

As previously discussed, ESG's analysis found that key financial metrics associated with Riverbed Cascade—such as ROI, payback period, and NPV—all increase for customers already taking advantage of Riverbed's Steelhead WAN optimization technology. ESG's default scenario did not assume the usage of Steelhead for WAN optimization; however, customers will also be able to benefit from this integration with Riverbed Cascade technology. In those remote sites with Steelheads deployed, the Cascade software is already integrated, thereby reducing remote branch cost yet providing complete coverage. Some examples of additional benefits cited by Riverbed customers using both Steelhead and Cascade are:

- The reduction or elimination of rolling trucks to remote and branch offices (ROBOs) to troubleshoot problems
- The ability to optimize network connections to remote locations
- Additional efficiencies gained by remotely backing up data from remote locations to the data center

Prospective customers should consider these and other potential additional benefits when evaluating Riverbed solutions.

<sup>3</sup> Source: ESG Research Report, [2012 IT Spending Intentions Survey](#), January 2012.

## The Bigger Truth

Enterprise networks are rapidly becoming larger and more complex as organizations continue to consolidate data centers and expand their virtualized server environments. Modular application architectures with multiple network links connecting a single application only further complicate the environment, and highly mobile and abstracted cloud environments make identifying and isolating a network performance problem even more difficult.

Fortunately, there are solutions to help network operations teams regain visibility into these environments and have more proactive control. Solutions like Riverbed Cascade enable organizations to quickly deploy and easily monitor large, complex enterprise networks. ESG's analysis finds that Riverbed Cascade will not only provide application aware visibility in a complex network environment, but it will also result in significant financial benefits and a positive return on investment when compared to commonly used solutions and manual efforts.

Among the key benefits offered by the Riverbed Cascade solution are:

- **Faster, more effective troubleshooting** – The ability to rapidly isolate faults in a complex network environment will greatly reduce outages and impacts due to performance problems.
- **Increased efficiencies** – Organizations have to do more with less—Riverbed helps them do that by providing insight into rapidly growing and complex environments. Riverbed Cascade solutions allow fewer staff to monitor and manage an even greater network.
- **Proactive monitoring** – By periodically scanning the network or analyzing historical data and setting threshold alerts, organizations can take a more proactive approach to network monitoring.
- **Detailed reporting** – Riverbed Cascade solutions collect and analyze a tremendous amount of data to create reports, enabling organizations to quickly get the right information to the right people.

New highly virtualized and cloud computing models will drive the need for increased visibility and proactive control. The ability to rapidly spot minor problems and fix them before they turn into major issues will be critical for businesses in an always-on marketplace. In addition, the ability to leverage data collected to analyze new scenarios will help organizations to more effectively and efficiently plan for new initiatives and future network requirements.

As evidenced by the financial benefits afforded by Riverbed Performance Management Cascade solutions in ESG's financial analysis, network monitoring should be an integral part of any operations center. Consequently, IT should look beyond today's reactive network solutions, and begin to embrace holistic network monitoring and real-time analytics. Network monitoring solutions that are faster to deploy, easier to manage, that can instantly identify faults, and provide predictive information-based analysis of historical data will be essential for meeting or exceeding SLAs in an always-on environment, and can deliver significant economic benefits to a business.

## Appendix A

### Methodology

For this project, ESG followed its standard, four-phase EVV methodology:

1. ESG conducted initial market research across Riverbed and other relevant IT vendors and customers to assess current market trends, vendor value claims, and the purchase considerations that are most important and relevant to current and prospective network performance management customers.
2. Based on the results of this initial research, ESG subsequently:
  - o Identified an accurate and appropriate customer use case (i.e., “scenario”) for Riverbed Cascade.
  - o Identified the “present mode of operation” (PMO)—effectively, the traditional approach that most customers currently take to meet their network performance management requirements, which, for the purposes of this report, includes systems monitoring and management platforms, SNMP network monitoring tools, network diagramming and modeling tools, packet capture tools, network performance analysis tools, and integration with help desk software and SIEM solutions—against which the costs and benefits of Riverbed Cascade were to be compared.
  - o Developed a comprehensive financial model (i.e., “Economic Value Validation” or EVV) designed to accurately qualify and quantify the costs and benefits realized by actual and potential customers who have deployed Riverbed Cascade.
3. ESG then conducted a series of in-depth interviews with IT professionals whose organizations have implemented Riverbed Cascade in a production environment as well as with systems engineering, service and support, sales, and marketing representatives from Riverbed. The data collected in these interviews was used to validate and/or modify assumptions in the EVV related to current customer environments and the direct and indirect costs and benefits attributable to both Riverbed Cascade and a typical network performance management solution. Product demonstrations and case studies of Riverbed Cascade were also used to identify specific user tasks as well as the end-user workflow and time associated with those tasks.
4. Once the EVV was finalized and all customer validation was complete, ESG then modeled two default scenarios designed to demonstrate the relative costs and benefits of Riverbed Cascade in a mid-sized business environment as compared with a similar-scale present mode of operation consisting of systems monitoring and management platforms, SNMP network monitoring tools, network diagramming and modeling tools, packet capture tools, network performance analysis tools, and integration with help desk software and SIEM solutions, as well as a larger environment using Steelhead.

## Appendix B

Cost Category	Description
<b>Hardware</b>	<ul style="list-style-type: none"> <li>Includes all costs associated with Cascade Shark, Profiler, Gateway, and comparable monitoring for alternative solutions, data collection, probes, and storage</li> </ul>
<b>Software</b>	<ul style="list-style-type: none"> <li>Includes software licenses for applications:                             <ul style="list-style-type: none"> <li>Riverbed Pilot and Riverbed Shark Virtual Edition</li> <li>Alternative monitoring console software, analytics, and virtual agents for data collection</li> </ul> </li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this includes costs associated with data center overhead such as floor space, power, and cooling</li> </ul>
<b>Professional services</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this includes additional services from the vendor or third party to provide training, security best practices consulting, and assistance during implementation</li> </ul>
<b>Staff</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this includes staffing costs internal to the customer such as project management, help desk, administrative personnel. Additional outcomes of reducing the time associated with these IT activities—such as the ability to refocus IT staff on strategic projects—are captured as benefits</li> <li>All position-specific salary information is based on publicly available median average salary data. For all employees, the model uses a fully burdened rate (i.e., cost of benefits, payroll taxes, etc.) of 40%</li> </ul>
<b>Maintenance and Support</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this covers any necessary hardware, software, and infrastructure. Support costs are estimated on an annual basis as a percentage of the purchase price</li> </ul>

Benefit Category	Description
<b>IT efficiency savings</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this includes reduction of IT administrative time and operational costs associated with:                             <ul style="list-style-type: none"> <li>System setup and maintenance activities for the Riverbed Cascade solutions or alternative solution components</li> <li>Management and administration of data collection and monitoring</li> <li>Time to handle events and problem reports in order to determine root cause</li> <li>Time to create and update reports for management and application owners</li> </ul> </li> <li>These savings are calculated based on the estimated number of IT staff hours required to perform the above tasks multiplied by the average burdened hourly cost for those staff resources</li> </ul>
<b>User productivity improvements</b>	<ul style="list-style-type: none"> <li>For both scenarios (Riverbed Cascade and PMO), this includes the operational cost savings for application users related to the following activities:                             <ul style="list-style-type: none"> <li>Improved end-user productivity that results from faster new application installation, periodic maintenance, and upgrade activities</li> <li>Improved end-user productivity that results from less disruptive network interruptions and performance degradation</li> <li>Improved end-user productivity that results from reduced application downtime and delays</li> </ul> </li> </ul>



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