Riverbed Cascade
Application Aware Network Performance Management

To deliver IT performance, you need complete visibility. Riverbed Cascade offers a superior network performance management solution for discovering, monitoring and troubleshooting your network and your critical applications. Now you can resolve performance problems before they impact the business, while lowering your IT management costs.

The Value of Application-Aware Network Performance Management

Managing a corporate network is an increasingly challenging task. You are expected to monitor application performance, maintain security and support corporate IT initiatives. But network complexity, high-bandwidth applications, and new technologies such as cloud computing and WAN optimization are creating visibility gaps. While expectations from the network team have grown, many network management tools fail to provide a full picture of the modern IT environment. As a result, these tools do not enable IT organizations to deliver consistent performance to the business. Organisations are increasingly finding significant gaps in their ability to secure and manage the availability and performance of key business services.

Riverbed Cascade is an enterprise-wide network performance management solution, providing visibility into all your data centres, offices, and mobile users. It uses network flow data, supplemented with packet-based performance metrics, to discover applications and monitor performance. It uses advanced behavioural analytics to track performance over time and alert you to any deviations from normal behaviour. That way you can resolve problems before end-users are impacted.

Cascade provides full packet capture and analysis capabilities, so you can drill down from the high-level application status to traffic flows to packets in order to determine the source of any performance bottlenecks. With a comprehensive view of server, application, and user dependencies, you can resolve current application delivery problems and plan future IT investments.

Typical results include a three-year ROI of 364 percent and a payback period of just 5.5 months. Mean time to resolve IT incidents is reduced by an average of 83 percent, and the duration of help desk calls by 87 percent, according to third-party research*. 
How it Works

Cascade collects network flow data from routers, switches, and other devices, and augments it with layer 7 application classification and performance metrics obtained via packet inspection. It uses continuous packet capture for retrospective analysis, and combines flow and packet data into a single data set with seamless top-down navigation. Both flow and packet sources are used to measure performance, identify changes from normal behaviour, and generate reports and alerts. Cascade does not use agents or synthetic transactions.

Cascade consists of the following components:

- **Cascade Profiler** – Analyzes network and application performance and sends alerts
- **Cascade Gateway** – Collects flow data, supporting all flow types (NetFlow, sFlow, IPFIX etc.)
- **Cascade Shark** – Captures packets from SPAN ports or taps, and indexes them for fast, efficient analysis
- **Cascade Sensor** – Provides packet-based application classification at layer 7
- **Cascade Pilot** – Packet analysis software for Shark and other packet capture sources

Cascade Gateway, Cascade Shark, Cascade Sensor, and Cascade Profiler are appliances that are sized based on the number of flows per minute, the network interface or the storage capacity. Cascade Pilot is a desktop software product.
How Cascade is used

Cascade provides users the ability to effectively manage change in their IT infrastructures. As a result, customers are able to ensure the availability, performance, and security of business services as well as to reduce costs and satisfy regulatory requirements. Specifically, customers use Cascade for:

**Application performance management** – Behavioral analytics combined with user-defined policies deliver the information and enforce the policies needed to proactively assure service delivery. Contextual alerts provide the information needed to quickly resolve issues.

**IT Troubleshooting** – Helping to provide a quick discovery of where the problem is, which users are affected, what applications and servers are involved. Such information allows quick triage of the initial call and will help to reduce the Mean Time to Resolution of the IT Incident.

**Improved security** – Extensive analytics identify hard to-detect security threats such as zero-day attacks, “boutique” malware, and credentialed attacks.

**Visibility into WAN and virtualised environments** – Get full visibility into traditionally “blind” environments such as optimized WANs and virtualized systems.

**Automated regulatory compliance** – Visibility and reporting capabilities support automated planning and policy enforcement and reduce the effort and cost required to support audits.

**Data center consolidations and moves** – Application dependency mapping provides the information needed for proper planning. Change impact information ensures smooth implementation.

**Discovery** – Discovery and dependency mapping that is pervasive, continuous, and passive for coverage that is accurate, cost-effective, and enterprise-wide.
Key Capabilities of Cascade

Riverbed Cascade helps customers large and small address multiple needs within their infrastructure, regardless of whether WAN optimisation is used or not.

The Initiatives that are common amongst our customers are as follows;

**Proactive Service Assurance**
- Define service-level objectives
- Monitor for service-level changes
- Enforce usage policies

**Example of How Cascade is helping** – An electronics insurance provider operates multiple call centers that service thousands of retail locations. When the WAN links between the call centers and their data centers became congested, service was disrupted. Without visibility into the WAN traffic, network operations personnel had no way of identifying the cause of the disruption. Using Cascade, the security team immediately identified a new Exchange server that had come online and was consuming an increasing amount of bandwidth in a failed attempt to replicate. With this information, the network operations team was able to resolve the performance problem in minutes. Furthermore, they implemented a user defined policy to monitor core WAN links for proactive service assurance to prevent future revenue losses due to protracted performance problems.

**Effective Planning and Risk Management**
- Automatically identify assets and applications as well as their dependencies
- Understand actual usage
- Understand the impact of change
- Identify bandwidth utilization by application
- Forecast capacity needs
- Optimize investments and deployment

**Example of How Cascade is helping** – A financial company was in the process of planning a data center migration. Cascade was implemented just prior to the move and immediately showed that there were a number of applications on the system that were improperly documented or completely unknown to IT and that the number of users who were accessing data center services was significantly higher than they had accounted for. Because Cascade was not available during the planning process, the company had used incomplete application documentation and out-of-date network maps. If the migration had moved forward, a number of critical applications would have been rendered nonfunctional and the business would have suffered serious disruptions. As a result, the company postponed the migration and integrated Cascade into the planning process to eliminate the risks associated with such moves.
Faster Problem Resolution

- Identify dependencies
- Distinguish between application response time and network latency
- Integrate context information into workflows
- Segment alerts based on operational role

Example of How Cascade is helping – An education organisation was experiencing Internet access problems every day at 9:30 am. A sniffer had been on the link for weeks but they were seeing so many packets and so much activity that they couldn’t decipher what was happening. They used Cascade to identify the top ports being used at that time, which applications were using those ports, and which clients were using those applications. They discovered that the anti-virus updates on a group of desktops had been mis-configured; instead of accessing an internal server, they were going to an external Internet site to download the updates and creating a surge on port 80. Correcting the mis-configuration resolved the daily slowdown.

Security

- Identify malware without signatures
- Identify internal or credentialed attacks
- Identify unauthorized applications, hosts, or servers on the network
- Understand the context of a security event
- Segment alerts based on operational role

Example of How Cascade is helping – A worm had broken out at a publishing company and two weeks later, the network security team was still trying to contain it. Within minutes of being installed, Cascade detected the worm, identified the infected hosts, and provided a containment plan. The company estimated that without Cascade, it would have taken them an additional 150 hours to contain the worm.

Cost-Effective Enterprise-Wide Coverage

- Passive deployment
- Centralized analysis console
- Intelligent interoperation with other systems

Example of How Cascade is helping – A retail organisation with more than 100 stores across 13 states needed a solution to assure service levels across WANs that ran revenue-generating kiosks and services. Company controls prohibit the deployment of remote probes, precluding installation of a number of probe-based solutions. The company was able to achieve its goals cost-effectively with the deployment of Cascade, which required only a single, centralized deployment but gives them enterprise-wide visibility and coverage.
Riverbed Cascade Saves You Money

During the beginning of 2010 many Riverbed Cascade customers were interviewed by IDC who conducted in-depth interviews to obtain qualitative information about the end user experience since deploying Cascade. IDC explored three areas where significant cost savings have been realised by Cascade customers; IT Staff Productivity, Cost Reduction in IT Budget and User Productivity improvements.

The diagram below highlights an annual cost saving of over $31,500 per 100 users across the Riverbed Cascade customer base.

![Average Annual Benefits of Riverbed Cascade (per 100 users)](chart)

**Reduced MTTR**

Cascade’s unique end-to-end view of the application delivery path expedites the troubleshooting process for both security and application delivery events. As a result, IT understands the inter-relationships among all the applications and the network and server components that work together to deliver application services to business users. This delivers savings by:

- Reducing revenue loss from business service disruptions.
- Reducing troubleshooting staff-hour requirements of highly skilled network and security staff.
- IDC Report showed that Cascade customers experience 34% fewer downtime incidents per month and the average incident duration was cut by 51%.
- In addition IDC found that across the Cascade customer base the MTTR was reduced from 12.8 hours to just 2.1 hours, on average.

**Minimal Hardware Deployment**

Cascade provides visibility and security with minimal deployment of devices such as IDS sensors or network probes. The lightweight deployment model scales by number of data centers as opposed to WAN links or remote sites. This delivers savings by:

- Significantly reducing capital expenditures required to reach full deployment.
- Eliminating operations expenses related to maintaining remote hardware and agents.
- IDC report showed how Cascade customers avoided the purchase of additional tools and benefited from annual savings of over $120,000 per annum in licence fees cost savings.
Optimized Use of Skilled Staff
Cascade’s focus on ease of implementation and accelerating workflow reduces the amount of time spend by skilled staff on management processes. This delivers savings by:

- Increasing the percentage of workflow that can be completed at a lower pay scale.
- Freeing up highly skilled personnel for problem avoidance and planning activities, eliminating the need to hire costly outside resources. IDC found that Cascade customers are saving an average of 2.27 full-time equivalents after deploying Cascade.
- Reducing the overall operational expense of network, application, and security management processes.
- IDC Report show how the meaningful data provided by Cascade at point of alert allowed Help Desk Staff to handle and manage calls a lot quicker and more effectively. The duration of average help desk call was cut was 87%.

WAN Bandwidth Reduction
Cascade customers can avoid costly bandwidth upgrades by identifying and minimizing non-business use of expensive WAN resources. This delivers savings by:

- Assisting in prioritization of WAN links that would most benefit from optimization, enabling you to focus capital expenditures for best results
- Identifying cases where bandwidth upgrades can be avoided, reducing ongoing WAN expense

Minimized Business Service Outages
The Aberdeen Group estimates that, on average, outages and slowdowns effect business revenues 9 percent. Cascade has unique abilities that enable early detection of and assurance against service disruption. This delivers savings by:

- Significantly reducing the time required to restore disrupted services which minimises the operating cost of problem resolution
- Reducing the number of service-affecting incidents, thus maximizing services income

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How Cascade is Unique

There are many products in the market which claim to give visibility across your infrastructure. Riverbed Cascade is unique in many areas and delivers additional value back to your business to help you maintain high level of user experience and high availability of your key business applications.

**Behavioural analytics** – The practice of applying static thresholds to protocols across segments of a network or to server performance is no longer practical in today’s complex environments. Cascade automatically learns the typical interactions between users, applications, and systems and automatically constructs performance and availability baselines. Advanced behavioral analytics identify abnormal activities and provide root cause and impact analyses so you can resolve issues before they affect business. You benefit from proactive problem resolution and reduced mean time to repair (MTTR) while ensuring the availability, performance, and security of business services.

**Dependency mapping** – Cascade automatically discovers the servers, network paths, applications, and users that comprise and communicate across your IT infrastructure as well as their interdependencies. User/application, application/server and server/server dependencies are used to construct interactive dependency maps that significantly improve troubleshooting and planning workflows.

**Steelhead Fluency** – All of the visibility that Cascade delivers between end points along with the performance analysis also needs to work in optimized environments too. Riverbed Steelheads now export more detail than standard NetFlow. This allows Cascade to measure the Round Trip Time of optimized traffic using this inbuilt capability which means you can easily compare the network performance and measure the benefits of optimization using Cascade, however network round trip times is not such a powerful indicator of End User Performance increases when optimization is at play. To help you measure End User Experience Cascade has a virtual Sensor that can be deployed using the Riverbed Services Platform (RSP) at remote offices. These metrics all feed into the Analytic capabilities allowing Cascade to alert you when the End User Experience is meaningfully degraded.

**Application delivery perspective** – Cascade uses relationship data to construct an application delivery path between back-end servers in the data center and application users. This unique application delivery perspective significantly enhances troubleshooting and planning workflows and provides the foundation for effective service delivery monitoring. Cascade alerts use this information to automatically inform operations personnel of the most likely causes of security and performance issues and aids to assist in problem resolution and prevention.

**User-defined policies** – Cascade provides the ability to define and monitor authorized usage, security, and performance policies. Policy violations generate alerts that provide rich contextual information about the policy, the specifics of the violation, the affected users, and possible mitigation actions. This unique policy-based approach allows customers to better support regulatory compliance, IT governance, and business service best practices.
Application and user identification – Today’s Web, virtualization, optimization, and multi-tier application platform technologies obscure the relationships between infrastructure, users, applications and business purpose. At the same time, effective IT management requires enhanced visibility into application usage – both end-to-end and across core network segments – to support today’s performance and security requirements. Cascade provides this visibility by combining network flow data with layer 7 application fingerprinting and user identity information.

Enhanced workflow – Whether integrating with NMS, SEM, or CMDB systems, informing consolidation initiatives, or helping operations personnel troubleshoot and resolve performance and security issues, Cascade goes farther than any alternative offering to improve the existing workflows and operational productivity. It automatically provides valuable contextual information and integrates with and shares data with a broad range of management tools and systems. It enhances your ability to understand how business services are delivered across your infrastructure while leveraging existing investments to maximise ROI.