Technical Validation

Riverbed Acceleration Services

Boosting Productivity and Collaboration with Fast, Predictable Access to Office 365 for Users Anywhere

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ESG Technical Validations

The goal of ESG Technical Validations is to educate IT professionals about information technology solutions for companies of all types and sizes. ESG Technical Validations are not meant to replace the evaluation process that should be conducted before making purchasing decisions, but rather to provide insight into these emerging technologies. Our objectives are to explore some of the more valuable features and functions of IT solutions, show how they can be used to solve real customer problems, and identify any areas needing improvement. The ESG Validation Team's expert third-party perspective is based on our own hands-on testing as well as on interviews with customers who use these products in production environments.

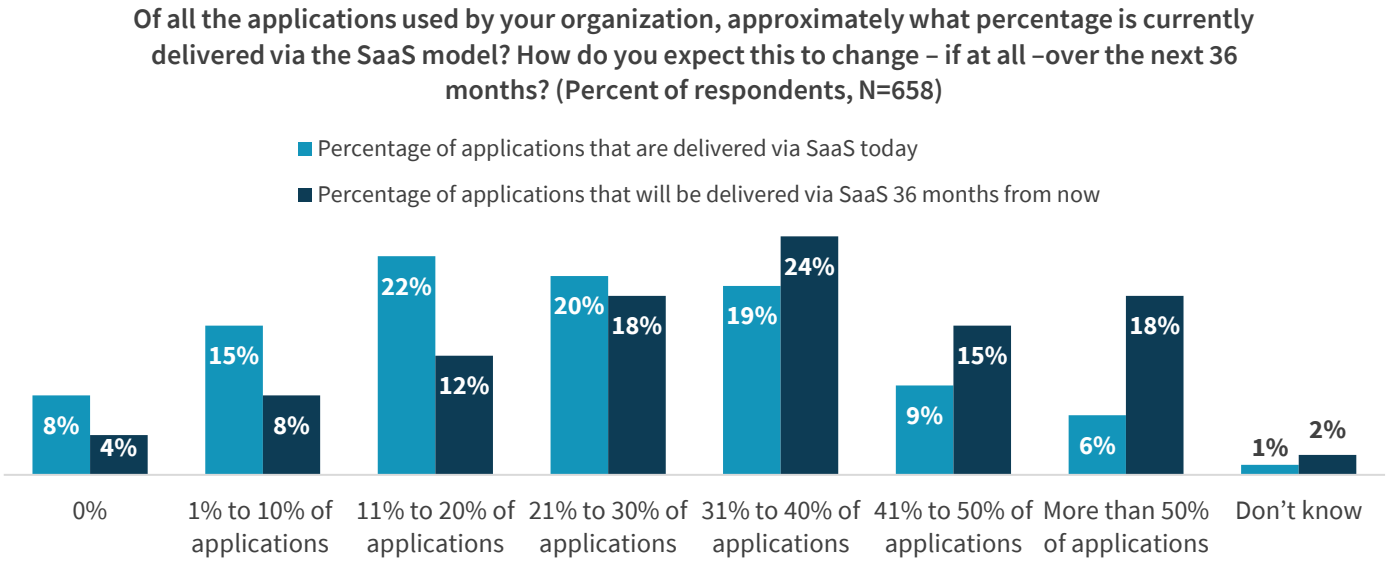
Introduction

ESG evaluated Riverbed SaaS Accelerator and Client Accelerator for enterprise SaaS apps and mobile clients to validate how this end-to-end solution accelerates SaaS application performance while overcoming the limitations of application latency, bandwidth constraints, and network congestion.

Background

Digital transformation efforts are driving organizations to leverage public cloud solutions (IaaS and SaaS) to enable their businesses to run more efficiently and deliver better experiences for their employees and customers. ESG research has documented the steady growth of SaaS adoption by enterprises and mid-market organizations and this year, more than half of organizations (54%) indicated that more than 20% of their applications would be delivered via SaaS. Even more telling is that three-quarters (75%) of respondents stated that, within three years, more than 20% of their applications would be delivered via SaaS. In fact, almost one-fifth (18%) believe more than 50% of their applications will be delivered by SaaS in next three years (see Figure 1).[1]

Figure 1. SaaS Adoption



Source: Enterprise Strategy Group

This new and highly distributed application environment provides numerous benefits for organizations, such as converting applications to an operational expense, avoiding the need to host applications in organizations' expensive raised floor data centers, and not having to worry about patching and upgrading applications. However, it also creates challenges for many organizations, as now the applications are in a public cloud and employees need to connect to them over WAN links and home/public internet connections, which can introduce multiple, often unpredictable network challenges with latency, bandwidth, and congestion, and provide a distinctly less than perfect experience.

In an attempt to address these issues, organizations have increased bandwidth to these cloud sites from their data centers and branch offices and deployed SD-WAN solutions to enable some remote locations to go direct to the cloud instead of hairpinning through the data center. While these solutions can assist in using the networks more efficiently, they may not help optimize or accelerate the movement of large or frequently accessed files from these sites, resulting in lost productivity and a poor experience.

[1] Source: ESG Research Report, *2020 Technology Spending Intentions Survey*, February 2020.

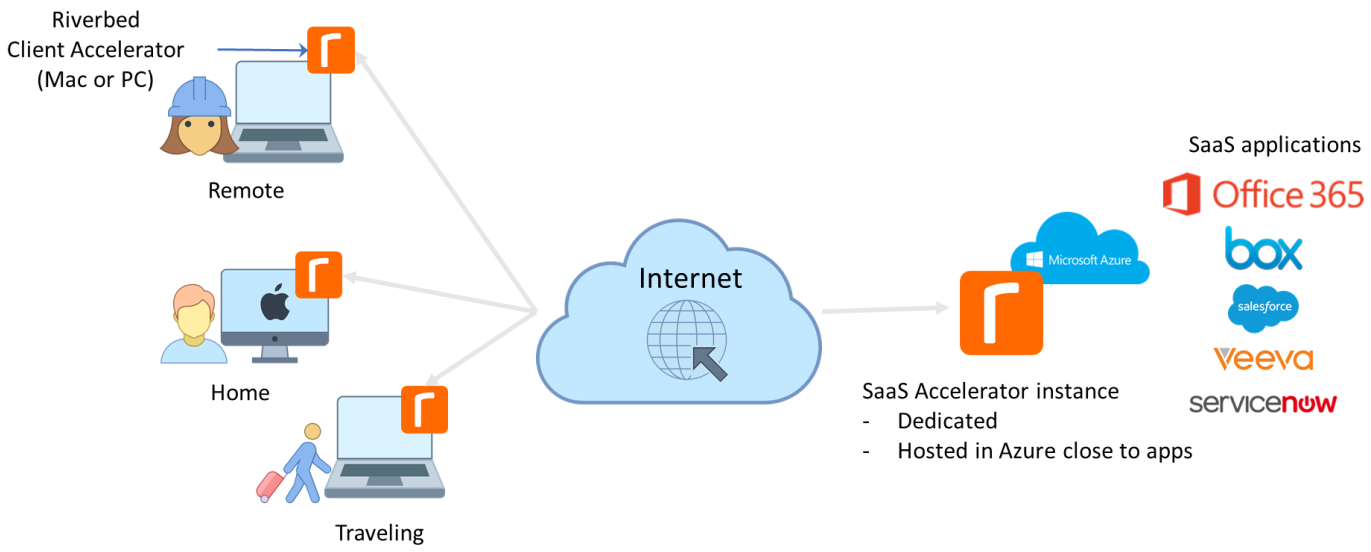
Organizations need to find solutions to enable employees who access applications while away from the office. ESG research indicates that 70% of workers expect to be productive from anywhere—at the office, home, or while traveling.[2] This issue has quickly become even more prominent with the global pandemic forcing employees to work from home. For most organizations, deploying data center or branch office technology at every home is not possible, meaning that virtually all employees will be limited by their home internet connection and most likely competing for bandwidth with other family members and neighbors also working or studying at home.

To better enable employees to work from home and be productive when using SaaS applications, organizations need to consider deploying technology that can be quickly and easily deployed on employee laptops. Solutions like Riverbed SaaS Accelerator can deliver results almost immediately, increase workforce productivity at scale, and deliver a better user experience.

Riverbed Acceleration Services

Riverbed SaaS Accelerator is a purpose-built, software-defined, cloud-based service, designed for the modern, dynamic workforce and engineered to ensure consistent performance of leading SaaS enterprise applications for anyone connecting from anywhere. The solution leverages Riverbed's 18 years of experience to optimize application performance regardless of network latency, bandwidth constraints, or application contention—all without requiring any changes to the SaaS provider's infrastructure. Acceleration for leading SaaS applications is implemented with a simple license activation. Any physical, virtual, or mobile SteelHead product can get paired with an organization's dedicated SaaS Accelerator instance(s). Delivered as a turnkey service, SaaS Accelerator enables customers to increase performance, save on operational costs, and ensure service level agreements. The solution allows organizations to discover and correct issues before they impact users and report out to multiple stakeholders.

Figure 2. Riverbed Acceleration Services



Source: Enterprise Strategy Group

Riverbed Client Accelerator—formerly SteelHead Mobile—is designed to deliver application acceleration to mobile workers anywhere with a minimal footprint software agent installed transparently on laptops or desktops. Extending the functionality of Riverbed's WAN Optimization and Application Acceleration services and solutions, Client Accelerator interacts directly with any server-side SteelHead or Riverbed SaaS Accelerator solution to optimize and accelerate on-

[2] Source: ESG Master Survey Results, *2019 Digital Work Trends Survey*, November 2019.

premises, SaaS applications, or cloud-based workloads. The Client Accelerator Controller helps IT teams manage client licenses and controls deployment, management, and reporting for software clients.

ESG Technical Validation

Testing of Riverbed acceleration services was designed to emulate a modern, distributed organization providing core services via SaaS to employees across the globe. ESG personnel tested from locations in the United States, Europe, the middle east, and Asia. We looked specifically at 3 key metrics: latency as it relates to application performance, data reduction specific to network efficiency, and productivity savings.

File Transfer Optimization

ESG tested in 13 locations[3] across eight countries worldwide. Testers accessed production Office 365 applications and Salesforce, both of which were hosted in Azure North Central US, in Illinois. Testing locations were selected based on multiple criteria, including distance from the Azure data center hosting the apps and network bandwidth. Home offices were the most common testing locations, along with public, shared WiFi hotspots. Latency between each location and Azure North Central US was measured as well as the actual upload and download bandwidth available.

Figure 3. Riverbed SaaS Accelerator Testing Locations

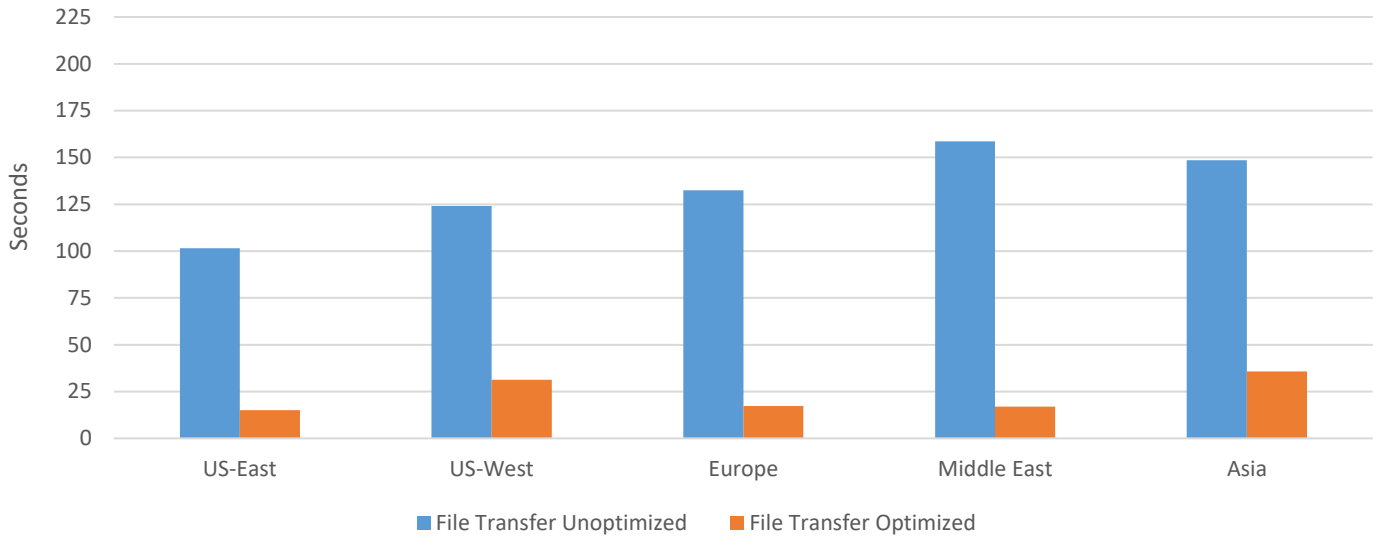
Source: Enterprise Strategy Group

ESG Testing

Testers performed uploads and downloads of a set of files of varying sizes in specified order and combinations, with a consistent method for measuring elapsed times to ensure an apples-to-apples comparison across testing sites. File transfer times were recorded pre- and post-optimization. Figure 4 shows the average file transfer time pre- and post-optimization across five global regions for the same set of files. The files totaled 200MB and our testers performed 50% uploads and 50% downloads. ESG saw significant reductions in file transfer times in every location we tested, regardless of available bandwidth or network latency.

[3] Testing was conducted in: Northern California and New England in the US, the UK, France, Germany, the UAE, India, Japan, and Australia.

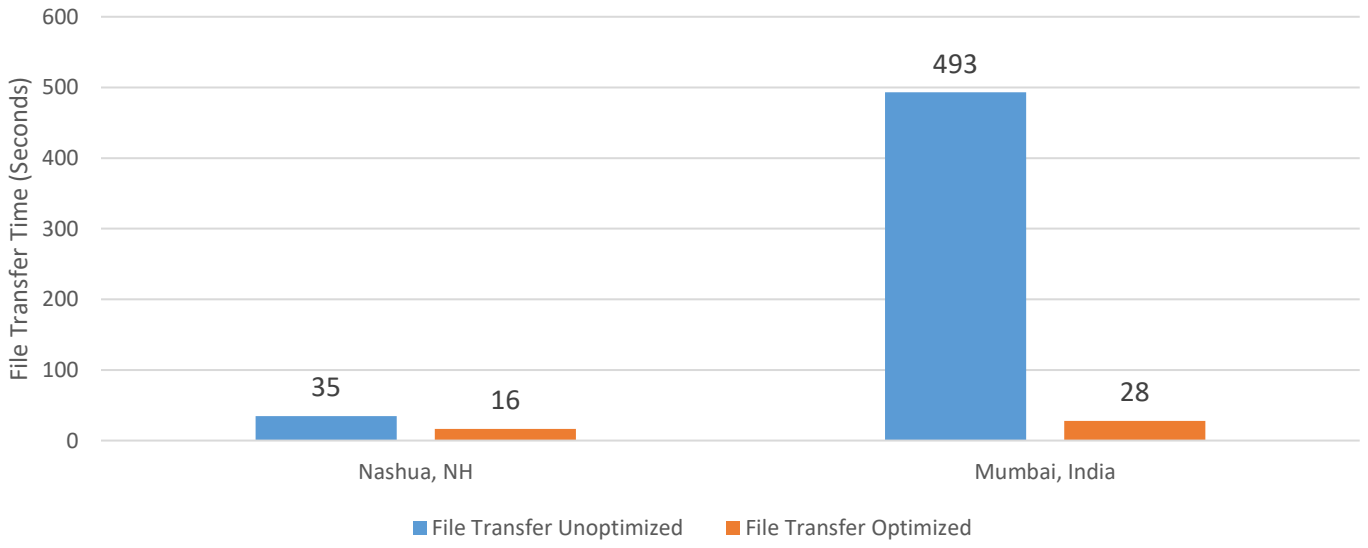
Figure 4. Reduction in File Transfer Times by Region



Source: Enterprise Strategy Group

A general pattern we noticed was that, as latency increased, the file transfer time *reduction* increased, regardless of available bandwidth. Said another way, the highest latency locations saw the most significant benefit. While New Hampshire, our highest bandwidth, lowest latency location—425Mbps at 35ms—recorded an impressive 52.6% average time reduction across uploads and downloads, Mumbai, our highest latency location with significantly lower bandwidth—9.6 Mbps at 227ms—recorded an astounding 93.4% reduction in time for file transfers. Figure 5 compares file transfer times for both locations, pre- and post-optimization.

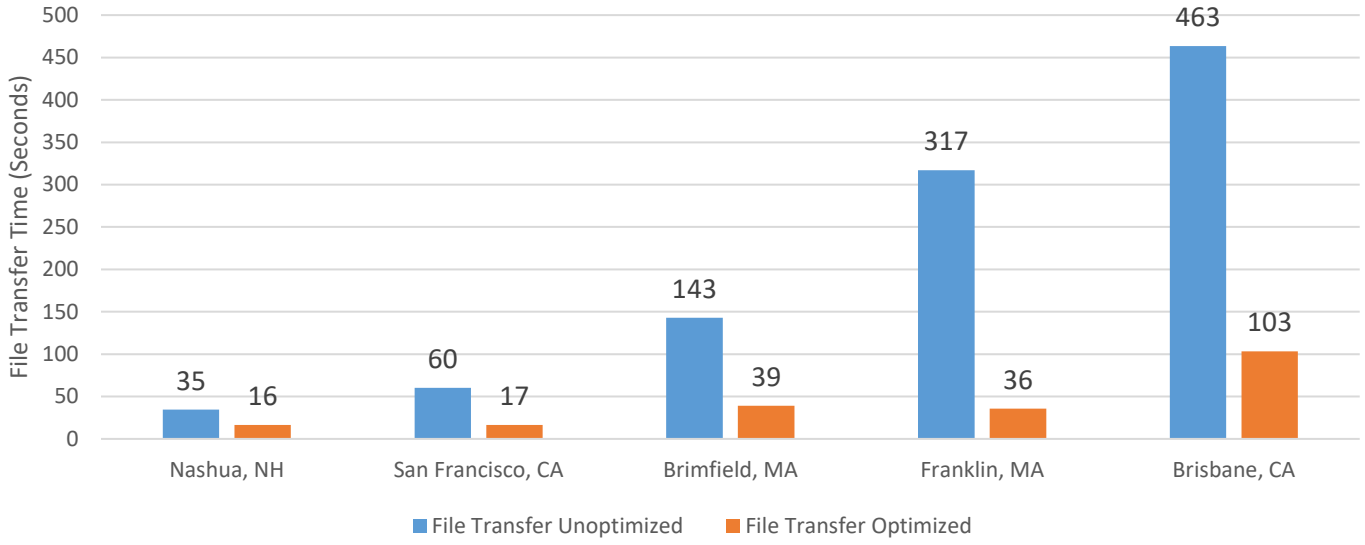
Figure 5. Reduction in File Transfer Times Compared by Lowest versus Highest Latency



Source: Enterprise Strategy Group

Next, we looked at how individual locations across geographies fared. Across the United States, unoptimized file transfer times varied widely, but as Figure 6 shows, all benefited from optimization, reducing transfer times by up to 88.8%.

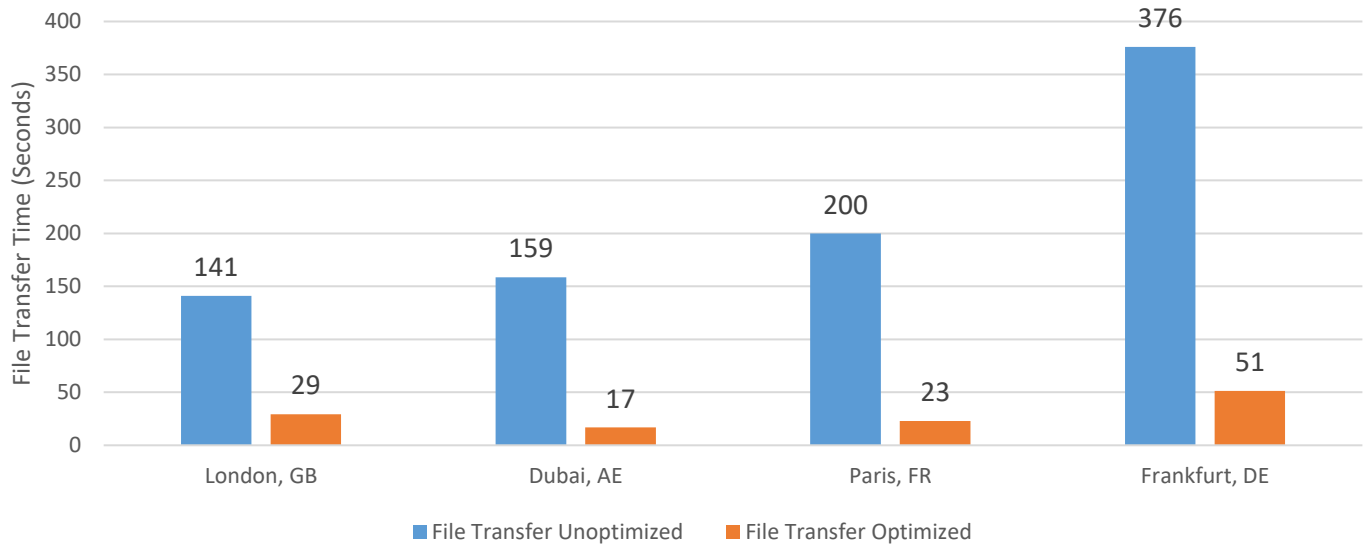
Figure 6. Reduction in File Transfer Times, United States



Source: Enterprise Strategy Group

The Brisbane, CA location in the US was tested on a busy, public WiFi network before the shelter-in-place guidelines had gone into effect. Latency was similar to San Francisco on average, but limited bandwidth and network congestion slowed file transfers considerably. The Riverbed Acceleration service was able to reduce the transfer time by 77.7%. Europe and the middle East tell a similar story.

Figure 7. Reduction in File Transfer Times, Europe and the Middle East

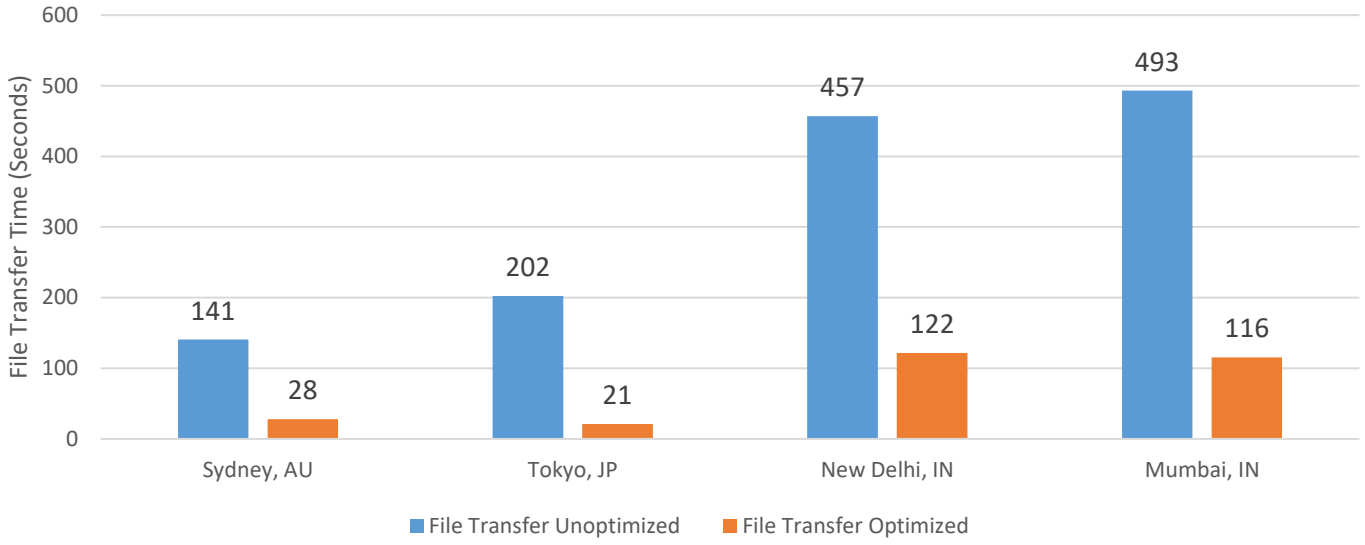


Source: Enterprise Strategy Group

File transfer times were highly variable due to the differences in network bandwidth and quality, but all sites benefitted from Riverbed acceleration services. Reduction in file transfer times ranged from 79.2% in London to 89.3% in Dubai.

Finally, we examined the sites in Asia, shown in Figure 8. Riverbed acceleration services consistently reduced file transfer times significantly, from 73.4% in New Delhi to 89.6% in Tokyo.

Figure 8. Reduction in File Transfer Times, Australia and Asia



Source: Enterprise Strategy Group

What the Numbers Mean

- Riverbed acceleration services significantly accelerated Office 365 access in every location we tested regardless of network bandwidth or latency.
- Higher levels of network issues—latency, congestion, and jitter—generally correlated to larger improvements.
- In many cases, transfers that took minutes were reduced to seconds.

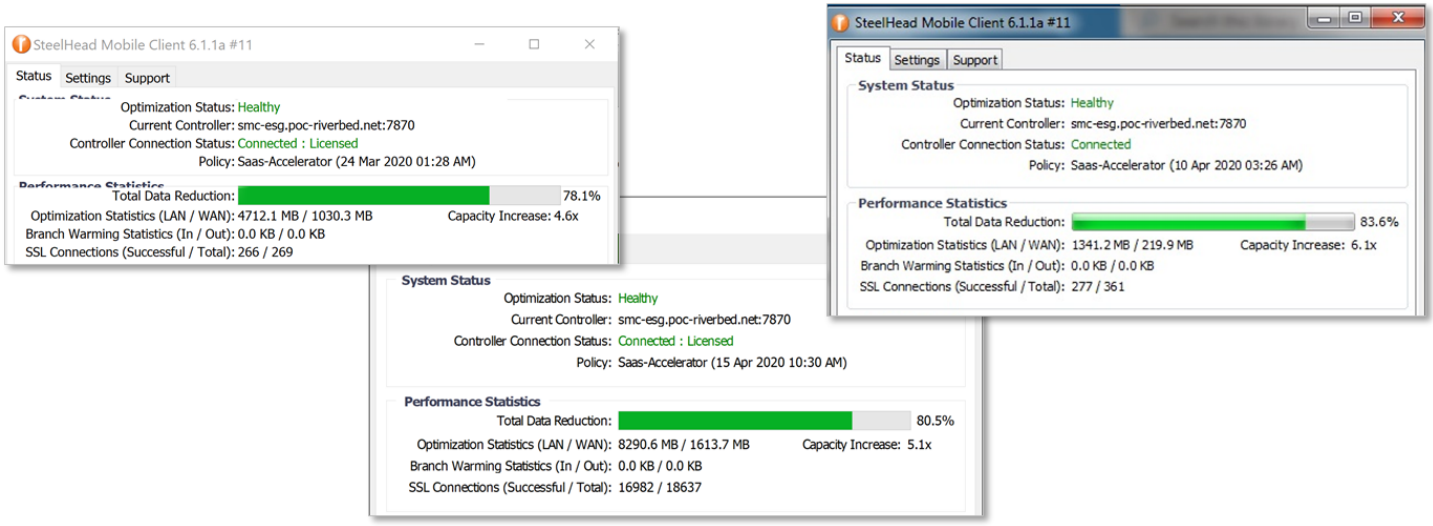
Data Reduction

Data reduction is an important component of Riverbed SaaS optimization, particularly as enterprises move to more data-rich collaboration apps. The more data moved across any given network, the more likely it is that the network will experience congestion and users will have a poorer experience. It should be noted that data reduction is only one of the techniques used by Riverbed to optimize remote connections to applications. Riverbed's deep knowledge of network protocols and application behavior play a significant role along with data reduction.

ESG Testing

ESG asked users to check the data reduction at their location by opening the Client Accelerator on their machines. Data reduction ratios were collected at the beginning, after the first round of warm-up tests, then in the middle, then at the end. Figure 9 shows data reduction at selected sites at the end of testing.

Figure 9. Data Reduction



Source: Enterprise Strategy Group

ESG found that data reduction was remarkably consistent across all sites, averaging nearly 81% globally by the end of the test. This is not surprising given that the testing was done with a consistent distribution of file types, sizes, and content across all our sites.

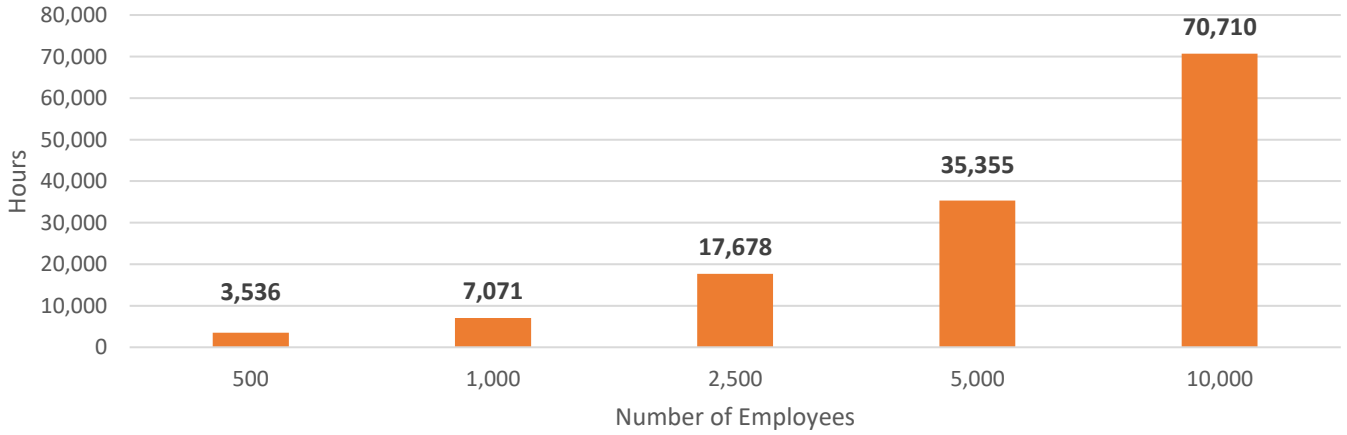
Productivity Benefits Over Time

ESG modeled cumulative time savings based on our testing to estimate productivity improvements that might be achieved using the solution.

ESG Testing

Calculations were based on an average workday data transfer of 100MB—combined uploads and downloads—and leveraged ESG's experience using Office 365 for collaboration and content creation. Pre- and post-optimization transfer times were averaged across all 13 locations used in these tests and extrapolated for organizations of increasing size. Figure 10 shows the potential savings for organizations from 500 to 10,000 employees.

Figure 10. Cumulative Productivity Improvements



Source: Enterprise Strategy Group

Over the course of a year—with an average 100MB of data transfer per workday—an organization can expect to save 7 hours per year, per employee. This adds up quickly for organizations, with the 1,000-employee shop reclaiming 7,071 hours and a 10,000-seat organization reclaiming more than 70,000 hours in a single year. To put this into context, every 250 employees using Riverbed acceleration services would reclaim the equivalent of a full year's worth of work for one FTE (full-time equivalent). Put another way, a 2,500-seat organization would save enough to staff a 10-person project annually, while a 10,000-employee company would save enough to staff a 40-person project every year. It's important to note that this applies to organizations with moderate data usage. Companies with heavier data access patterns where workers move more data into and out of the cloud daily would see even greater productivity savings.

Riverbed Acceleration Services in the Real World

When the structured portion of testing was complete, testers continued to work normally, and were interviewed to gauge their experience and impressions. The feedback was quite positive. Users observed that the service was completely transparent and allowed them to work exactly as they had before, with no noticeable changes—other than faster file transfers.

One tester said, "I was impressed with its simplicity and effectiveness. Improvements in transfer rates were immediate after the agent was installed, and I was able to reproduce them consistently. I'm a believer." While another commented, "The results we got uploading and downloading test files were excellent, but what really impressed me was the way it just *worked*. After I finished with the test files, I did my day to day work for the rest of the month, and completely forgot I had it installed, until I had to uninstall it. The return to non-optimized working was a letdown."

Content creation and collaboration are key components of ESG's business. Based on analysis of the data and the experience of the testers, it's easy to recommend that ESG evaluate Riverbed acceleration services to improve our own users' effectiveness and experiences.

Why This Matters

Workers expect to be productive from anywhere—at the office, home, or while traveling. Organizations have been leveraging SaaS in part to help address this issue, providing access to critical applications that are not tied to their on-premises data centers. This issue has gained prominence with the global pandemic forcing more employees to work from home. This impacts virtually all employees based on their location, home internet connection, and how congested their home network and local ISP is.

What is needed to enable employees to work from home or anywhere away from a primary office setting effectively using SaaS applications is technology that can deliver results quickly and transparently, increasing productivity and delivering a better user experience.

Through hands-on testing and actual production use, ESG has validated that Riverbed acceleration solutions provide significant and consistent optimization of connectivity to SaaS applications. Running unnoticed in the background, Riverbed SaaS Accelerator and Client Accelerator optimize performance and productivity for remote users, regardless of location, bandwidth, or latency, often rivaling local access. ESG used Riverbed acceleration services to improve Office 365 and Salesforce performance for our mobile workforce, enabling more productive knowledge work and collaboration.

The Bigger Truth

The application landscape is rapidly changing as organizations continue to drive digital transformation initiatives to increase operational efficiency and create positive experiences. With organizations rapidly adopting SaaS applications, it will be imperative to ensure employees are still productive and having a positive experience accessing applications and files in the cloud. While this would be important for normal business operations, it is even more critical now with increasingly mobile workforces and a global pandemic forcing an increased number of employees to work from home.

The Riverbed acceleration services validated by ESG include Riverbed SaaS Accelerator and Client Accelerator. SaaS Accelerator is a purpose-built, software-defined, cloud-based solution, designed to ensure consistent performance of leading enterprise SaaS applications, while Client Accelerator, designed for the modern, dynamic workforce, enables fast, reliable application performance for anyone connecting from anywhere. The solution leverages Riverbed's 18 years of experience to optimize application performance regardless of network latency, bandwidth constraints, or application contention—all without requiring any changes to the SaaS provider's infrastructure. With Riverbed Client Accelerator, remote workers are no longer remote. Client Accelerator offers a flexible, scalable management tool that streamlines provisioning of large-scale remote and mobile deployments.

As this technical validation has demonstrated, Riverbed acceleration services, including SaaS Accelerator and Client Accelerator, are able to significantly and consistently accelerate data transfers to and from SaaS applications from anywhere on the planet. ESG found that organizations can enhance both productivity and the user experience with SaaS Accelerator, saving minutes of time per day, per user. Organizations can reclaim thousands of hours of lost productivity per year. In a hypothetical company with 10,000 remote workers, this can add up to a full year of recovered productive time for 40 employees. Organizations can very easily attach this technology today as part of a revised business operations plan and enable workers to be productive from anywhere. If your organization is looking to improve the remote user experience with a solution that deploys into an existing infrastructure with minimal effort and disruption, Riverbed SaaS and Client acceleration offerings are worth serious consideration.

Appendix

Table 1. Average File Transfer Time Reduction by Location

Location	Bandwidth	Average Latency to Azure North Central US	Average Time Reduction Uploads	Average Time Reduction Downloads
Nashua, NH	425 Mbps Down 41 Mbps Up	35 ms	52.6 %	52.7 %
Brimfield, MA	51 Mbps Down 12 Mbps Up	58 ms	58.3%	62.2%
San Francisco, CA	120 Mbps Down 119 Mbps Up	60 ms	79.9%	67.3%
Brisbane, CA	5 Mbps Down 5 Mbps Up	60 ms	81.8 %	72.2 %
Franklin, MA	50 Mbps Down 5 Mbps Up	65 ms	90.9 %	65.4 %
London, UK	32 Mbps Down 16 Mbps Up	107 ms	82.7%	71.7%
Paris, France	20 Mbps Down 8 Mbps Up	110 ms	91.4%	81.1%
Frankfurt, Germany	9 Mbps Down 3 Mbps Up	120 ms	87.8%	82.1%
Tokyo, Japan	238 Mbps Down 144 Mbps Up	151 ms	80.3%	96.8%
Dubai, UAE	64 Mbps Down 66 Mbps Up	204 ms	84.8%	79.0 %
New Delhi, India	9.5 Mbps Down 4.8 Mbps Up	211 ms	93.3 %	83.6 %
Sydney, Australia	50 Mbps Down 20 Mbps Up	213 ms	84.7%	75.7%
Mumbai, India	9.6 Mbps Down 4.7 Mbps Up	227 ms	95.5%	91.2%

Source: Enterprise Strategy Group

Enterprise Strategy Group is an IT analyst, research, validation, and strategy firm that provides market intelligence and actionable insight to the global IT community.

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