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The Fastest Shopping Carts on the Internet

Combining High-Performance Networks,
Data Centres and Architectures for
eCommerce Speed

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Executive Summary

Retailers can purchase the most advanced eCommerce platform and design a site with all the bells and whistles, but unless all their site content and pages render rapidly, the investment is as good as wasted. Today's eCommerce sites must satisfy demanding consumers who will quickly abandon a site that's slow – and that speed is measured in mere seconds. Serious retailers need to give as much consideration to their hosting provider as to their eCommerce platform. In fact, to maximise the value of their platform investment, they need to partner with a provider that provides the three crucial pillars enabling optimal performance: a fast network, a global data centre footprint, and an architecture customised to address the retailer's eCommerce needs. PEER 1 Hosting delivers in all three areas, for unsurpassed eCommerce site performance. In fact, the combination of these along with our expertise in designing, deploying, and managing the entire infrastructure across multiple platforms – including Magento, Hybris, Oracle ATG, IBM Wepsphere, to name a few – set us apart from all other hosting providers.

The Criticality of eCommerce Site Performance

Most any hosting provider can host your eCommerce site, but very few can ensure that the site performs and scales without performance loss in perpetuity under ever-changing circumstances. Site performance is, and always will be, the name of the game when it comes to eCommerce. In fact, two of the biggest issues plaguing eCommerce sites are page load times and speed of checkout. If site performance doesn't satisfy consumers' demanding expectations, shoppers will abandon the site. Consider that 47% of consumers expect a web page to load in 2 seconds or less.¹ And 79% of shoppers who are dissatisfied with website performance are less likely to buy from the same site again.²

When it comes to performance issues many eCommerce businesses turn immediately to their developers and database administrators to optimise code, but this is only an initial step that typically realises incremental gains. Optimising the infrastructure powering their site, however, realises performance gains by order of magnitude. Many retailers don't realise it but their eCommerce platform becomes severely impaired under routine traffic loads without the right infrastructure supporting it. Under heavy traffic loads, their platforms regularly crash.

Performance not only impacts the site visitor experience, it impacts search engine marketing spend and results. While Google does not specify how site speed is weighted within its algorithms, it does acknowledge that page load times impact search engine optimisation (SEO) rankings and Quality Scores for PPC advertising. Faster sites, in general, realise improved SEO rankings and lower pay per click (PPC) costs, as speed is what satisfies those who use search engines.

The problem resides in the fact that as enterprise eCommerce platforms handle more traffic and transactions they also tend to become more sophisticated with advanced functionality, becoming computing resource hogs, negatively impacting site performance. As a result, companies cannot just throw these enterprise eCommerce platforms onto out-of-the-box servers and devices and expect them to work as intended and needed. Instead, they need to carefully analyse and choose the underlying infrastructure to ensure their platform runs at its peak capabilities. Likewise, retailers cannot assume that all networks and data centres are created equal when it comes to uptime and mitigating latency. This white paper explores these infrastructure considerations and discusses the optimised architectures that PEER 1 Hosting has developed to ensure optimal performance for every eCommerce site.

Understand That One eCommerce Hosting Package Doesn't Fit All

Most eCommerce sites are mission critical because they are core to reaching a target market and generating revenues. Yet many hosting companies simply offer basic, one-size-fits-all eCommerce packages to suit a narrow set of customers with like needs. These offerings don't address the unique performance issues facing every online retailer. They play to the lowest common denominator with the highest margins for profitability – because it requires less expertise and effort on the provider's behalf. Usually only the largest of retailers benefit from customised or optimised architecture builds.

PEER 1 Hosting delivers solutions that bring accelerated levels of performance regardless of a retailer's size. That's because its solutions are built upon highly calibrated, high-horsepower infrastructure, from the network and data centres to the hardware architectures and components – all designed to handle routine traffic volumes and planned or unplanned traffic spikes with ease.

Typically, hitting \$10-15 million in revenues is a critical time for an eCommerce business. Yet it's at this point that many retailers find their infrastructure holds them back from achieving the next level of success. Specifically, as the site's performance declines under the weight of more traffic, transactions and functionalities, the shopper experience suffers, resulting in abandoned sites and shopping carts. Retailers can spend significant amounts driving traffic to their sites using PPC and SEO, but if their sites perform sluggishly, they see low return on their investments as site visitors click away. In addition, according to researchers, the average shopping cart abandonment rate of eCommerce websites is 67.93%.³ That means shoppers didn't complete the checkout process 68 times out of 100 times. When PPC, SEO, and shopping cart results are sub-optimal, the e-tailer's business suffers dramatically.

If an eCommerce site generates \$100,000 in daily revenues, a one-second page delay could potentially cost \$2.5 million in lost sales every year.

According to Forrester Research, 17% of US consumers who failed to purchase a product or service online took their business to a competitor, and 17% of frustrated consumers walked away from their web purchases. Forrester projected the value of those lost orders for an average retailer using data from *The State of Retailing Online 2010*, a Shop.org study conducted by Forrester Research. It found that when retail sites fail to meet user goals, they are at risk of losing more than \$47 million per year in direct revenue.⁴

In their attempts to address these issues, eCommerce companies make tradeoffs when it comes to optimising site performance. They either focus on making the site faster for search engines or on creating an immersive shopping experience. Whatever their focus, they typically dedicate significant hardware and resources such as developers and database administrators to optimise applications or database response times. As a result, they never see a full return on their investment, because they never address the root cause of their most significant performance issues – the infrastructure.

The Three Crucial Components for Unfailing Performance

When it comes to the infrastructure supporting an eCommerce platform, bigger isn't better – better is better. In other words, continuing to throw more money, people and hardware at the problem doesn't necessarily deliver the desired results. **The key is to adopt a better network, better data centres and a better reference architecture** that makes it possible to deliver stunning performance. Retailers can find this in an outsourced eCommerce infrastructure that's been optimised specifically for their needs and for the shopper experience.

Why leave such a critical business challenge up to a company that doesn't specialise in eCommerce and doesn't understand the implications and causations linking infrastructure and performance?

Our FastFiber Network™ is Critical to Satisfying Shopper Expectations

The first critical element of infrastructure that enables high performance is a far-reaching, fast, and reliable network. Often, retailers overlook the network — even though it's the connection between eCommerce sites and prospective shoppers. Yet historically, networks have caused many significant outages and latency issues for many of the largest retailers, whether they be click-and-mortar or pure-play eRetailers.

Network outages can be caused by major equipment failures, targeted hacker attacks, or even simple human errors. Whatever the cause, this downtime impacts all traffic traversing the network, which often includes eCommerce site visits and transactions. The fact is that most eCommerce hosting companies don't own and operate their own network. Instead, they send traffic over lesser tier networks. As a result, their customers' traffic is susceptible to the issues plaguing the Internet at any given moment.

PEER 1 Hosting has built and evolved its own fully managed FastFiber Network comprising 25,000 miles of 10Gbps fibre across North America and Europe linking together 19 data centres (see the next section for more on our data centres). This intelligent network can detect potential traffic jams and latencies, empowering PEER 1 Hosting's Network Operations Centre (NOC) experts to monitor and reroute data at any given second to ensure high performance up to the last mile. Because PEER 1 Hosting controls this network, it transports only hosting customers' traffic. As a result, the NOC always knows how the network is being used and can anticipate and mitigate potential issues with data transfers. This isn't possible for eCommerce sites relying on lower-tier networks that are considerably slower by design and far more susceptible to latencies caused by traffic volumes or malicious traffic. The retailer's traffic is lumped with all traffic for other retailers and businesses on the network, which is often the reason for slowdowns during peak shopping periods. PEER 1 Hosting, on the other hand, can always optimise performance on its own network.

Network outages mean eCommerce sites are unavailable. That's the same as the store doors being locked during the middle of the shopping day.

At the same time, PEER 1 Hosting is connected to over 1,050 network providers and multiple Tier 1 upstream providers, including Tiscali, TATA, and Comcast – and growing – so data speed and performance do not suffer once traffic leaves the FastFiber Network. Because the quality of the network hop is critical in terms of performance, capacity and latency, PEER 1 Hosting vets all its network partners to ensure they can satisfy its exacting standards for uptime and performance. To address rare cases where these network partners fail to meet their obligations, PEER 1 Hosting goes through predefined immediate escalation paths to resolve issues outside of its network.

Geographically Dispersed Data Centres Get Retailers Closer to Shoppers

With consumers visiting sites from across the country – or from around the world – it's critical that eCommerce sites be served from geographically dispersed datacentres. This makes it possible for site content and responses to traverse fewer points of presence (POPs) to reach shoppers and vice versa. That in turn leads to lower latency and faster performance.

Case Study: The Business Impact of the Right Hosting Infrastructure

Climax Media, a full-service web agency, understands firsthand the importance of the right hosting provider. After experiencing poor site performance with a previous hosting provider, it migrated to PEER 1 Hosting. Moving to an enterprise-grade infrastructure, a fast network, and geographically dispersed data centres delivered the performance – and business results – it was seeking. Climax Media has experienced the following results on its own site (and is seeing similar results on the sites of its eCommerce customers):

- Improved page load times by over 18%
- Decreased bounce rate from traffic driven by Google AdWords by more than 13.5%
- Ranks for 30-40 keywords on first page of Google, up from 15-20
- Experienced more than 7% increase in site visit duration
- Saw more than 17.5% increase in click-through rate on landing pages

PEER 1 Hosting operates 19 state-of-the-art data centres in 14 cities across North America and Europe and 21 network POPs. These data centres house the hardware and software serving the eCommerce site. And when it comes to responding quickly to site visitor requests, it's not about how close hosting servers are to the retailer's headquarters – it's about how close they are to shoppers. The highly secure and redundant IT infrastructure of these data centres – featuring regulated climates – protects retailers' servers, web presence and business, ensuring the utmost in uptime. Plus, the combination of geographically dispersed datacentres connected by the FastFiber Network and connections to over 1,000 network providers typically means less latency caused by fewer network hops.



Figure 1. PEER 1 Hosting's data centres are geographically dispersed for close proximity to retailers' site visitors

Our Optimised Hardware Stacks Deliver Results

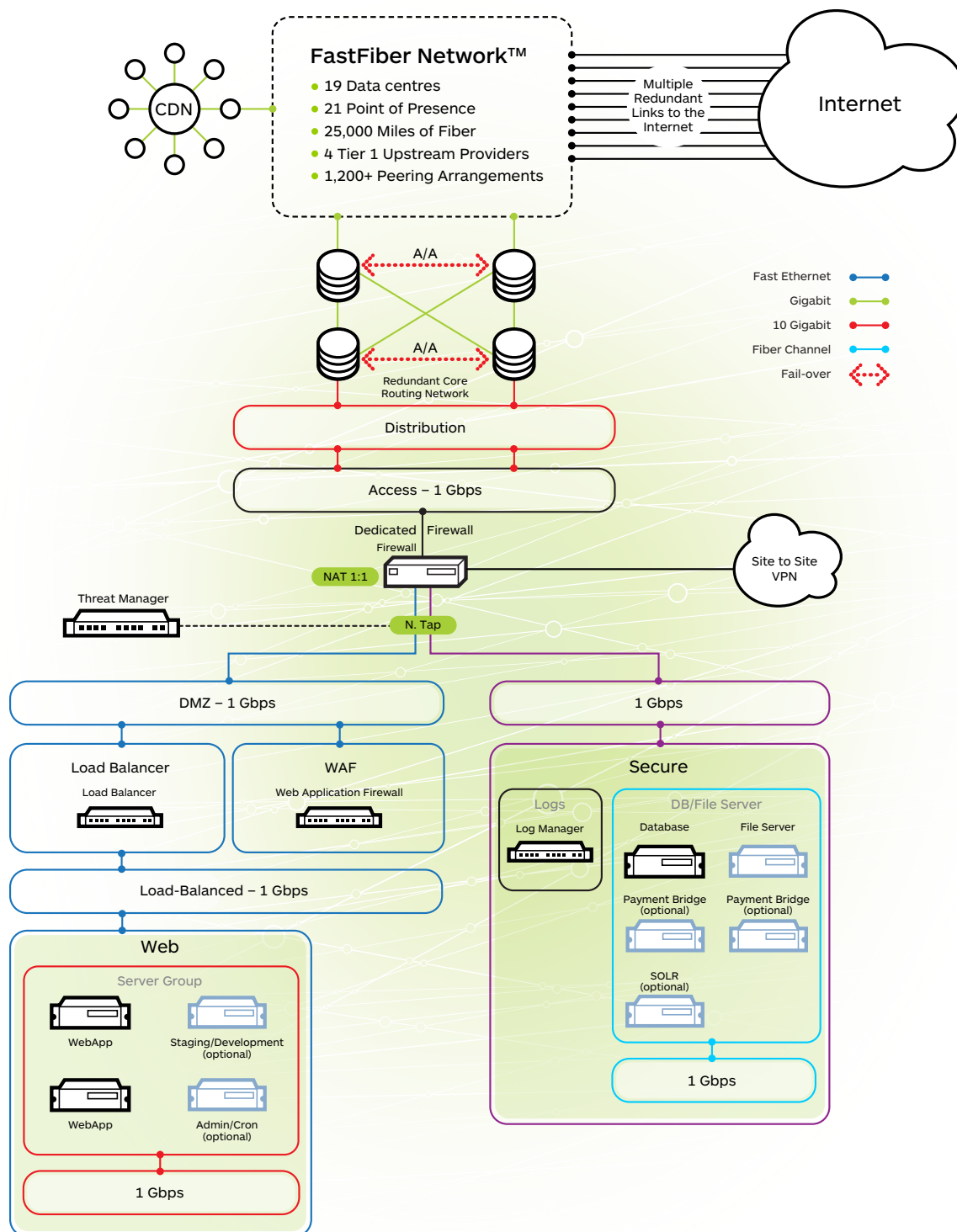
After the network, retailers need to consider the infrastructure serving their eCommerce platform. It's not sufficient or efficient to host enterprise-level eCommerce solutions on commodity servers and to tinker with the servers over time to accommodate performance and scalability concerns. This method quickly becomes untenable as the site sees a growing amount of traffic.

A strategic approach is to consider what functionality the site needs to deliver, and when and how often peak traffic hits. The next step is to then build infrastructure that addresses the site's unique scalability and performance requirements. Yet few hosting companies support this methodology. PEER 1 Hosting, however, optimises the hardware stack – including stripping out unnecessary server features and optimising databases and other components – to deliver the desired results. At the same time, customers can choose from a range of servers, including the latest servers featuring the Intel® Sandy Bridge chipset and other advanced components for more server horsepower. These servers are more resilient than standard servers.

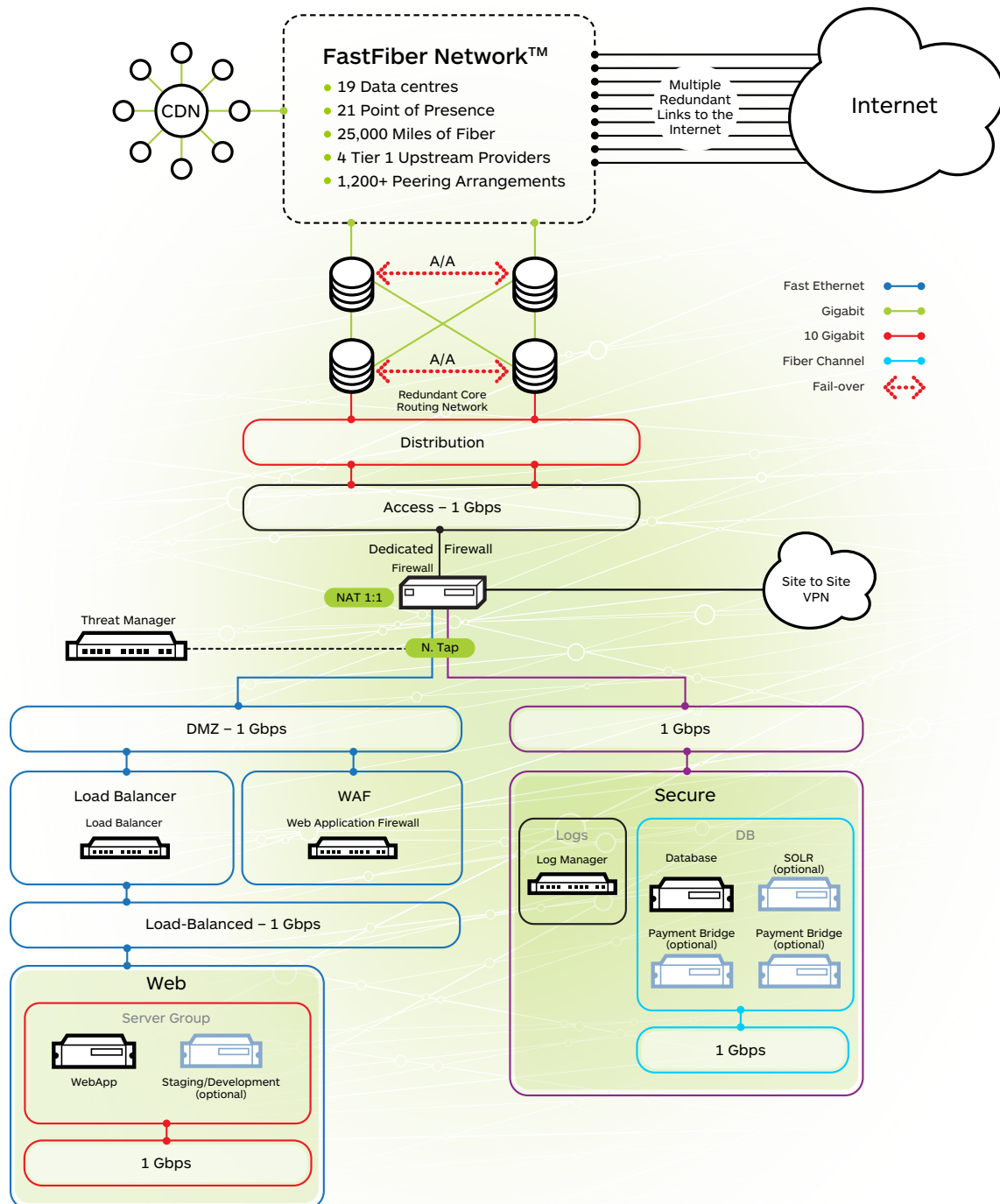
Working hand in hand with leading eCommerce platform developers and their ecosystems of partners, PEER 1 Hosting is developing a set of next-generation reference architectures calibrated to the specific requirements of these eCommerce solutions. This allows it to deliver turnkey solutions that are optimised to meet the exacting needs of demanding eCommerce customers. At the same time, it right-sizes each solution to address each customer's platform, traffic patterns, and business needs, and offers customers options at every layer of the technology stack. As a result, customers gain the utmost flexibility along with unsurpassed performance and reliability.

Best Practice eCommerce Hardware Configurations

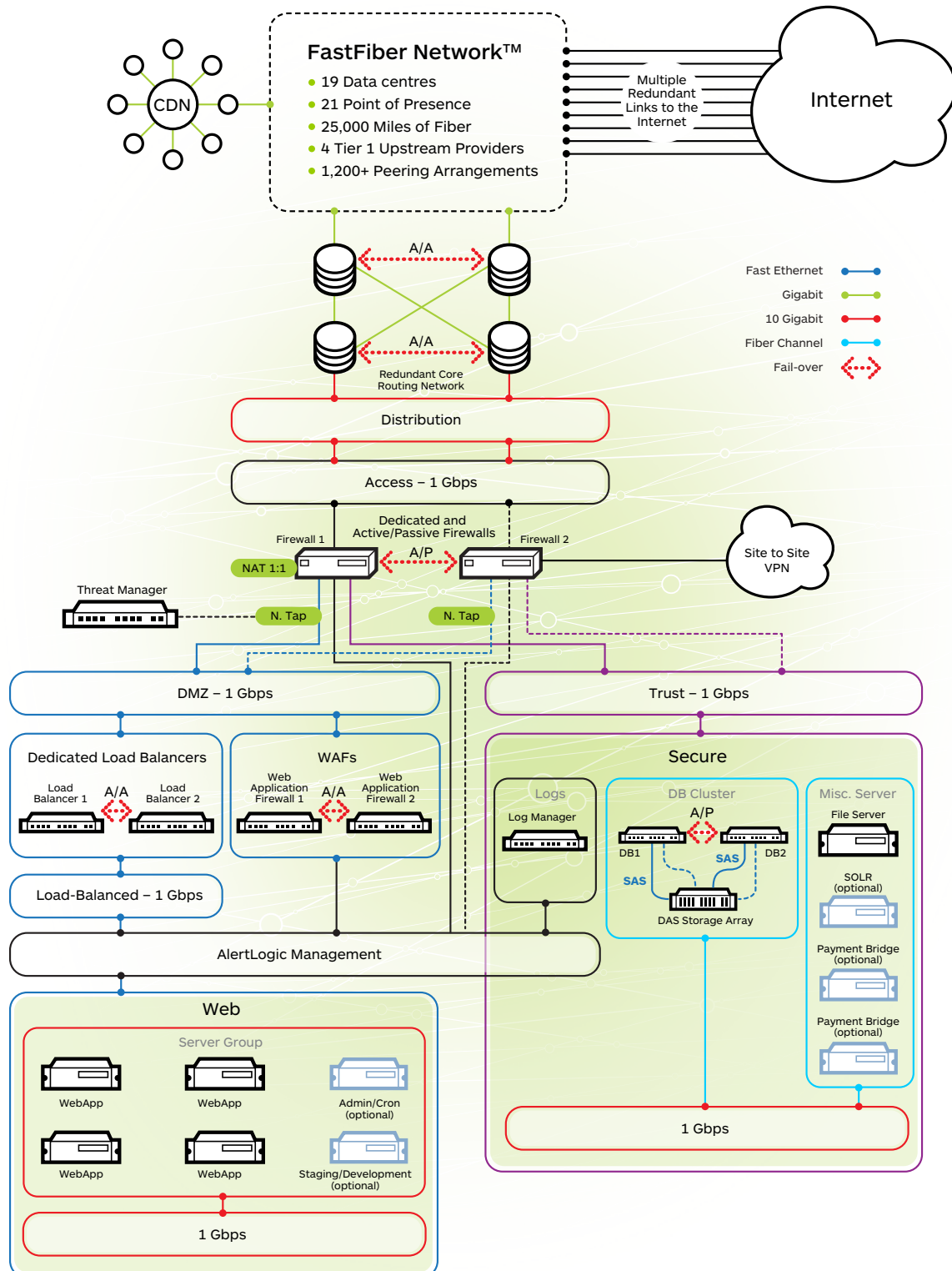
Example 1 – eCommerce Web App Cluster



Example 2 – eCommerce High Availability 2 Node Cluster



Example 3 – PCI Compliant eCommerce Cluster



Conclusion: Leverage Our Infrastructure For Measurable Competitive Advantage

In a world where every second counts, eCommerce platforms need to be built for peak performance. To drive performance that matters, retailers need to work with a hosting company that understands their core eCommerce platform and augments that knowledge with infrastructure and technology stack expertise. The right solution provider assesses the platform and infrastructure holistically and then orchestrates all components to deliver an order-of-magnitude performance improvement.

With PEER 1 Hosting, retailers can take advantage of customisable, next-generation reference architectures and a privately owned FastFiber Network that connects state-of-the-art data centres across the US, Canada and EMEA – being used to power some of the world's most successful eCommerce sites. As a result, they can deliver the performance and scalability expected by today's consumers, and compete on a level playing field.

Contact our eCommerce team today to see how we can help you ensure eCommerce success.

About the Authors

Craig Hendrickson, eCommerce Specialist

Craig specializes in the design and implementation of eCommerce hosting solutions for clients and solution implementation partners/developers. He has assisted in over 300 (successful eCommerce projects on PEER 1 Hosting's infrastructure. Craig is experienced in offering scalable solutions ranging from entry-level to complex mission critical hosting configurations, and is well versed in PCI Compliance, Magento, Linux, Windows, VMware, Internet security, disaster recovery and high availability solutions.

Casey Thomas, eCommerce Specialist

Casey is a seasoned professional with 18 years of experience in technology and IT. With an emphasis on eCommerce and security, along with a passion regarding PEER 1 Hosting customer advocacy, Casey recently completed the Payment Card Industry Security Council DSS training program in order to deeply understand the complexities of PCI and how it translates to our customers' strategic eCommerce success.

Footnotes

¹ KISSmetrics, *How Loading Time Affects Your Bottom Line*, <http://blog.kissmetrics.com/wp-content/uploads/2011/04/loading-time-sml.jpg>

² Ibid

³ Baymard Institute, *17 Cart Abandonment Rate Statistics*, <http://baymard.com/lists/cart-abandonment-rate>

⁴ Forrester Research, *Websites That Don't Support Customers Waste Millions*, August 21, 2012