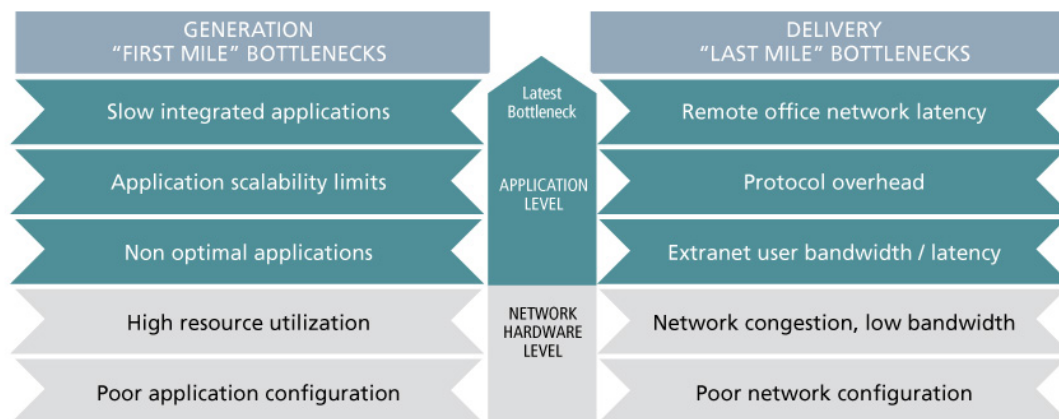




## F5 WebAccelerator – Overview

**Overview** Web enabling applications has been a tremendous success for today’s enterprises, offering enhanced user productivity, lower costs, and greater overall efficiencies. But the rush to the web has brought to light all new performance issues. At first, fixing these problems was a relatively simple affair —tune the application, add hardware, or purchase additional bandwidth for the corporate backbone network. But as user populations grew, especially via new remote users outside of the corporate LAN, additional problems emerged that could not be solved by the old methods. This paper introduces a new method for maximizing the performance of web pages, applications, and portals delivered to intranets, the Internet and extranet users, aptly named the F5 WebAccelerator.

**Challenge** As more and more companies web-enabled their applications, server issues (generation bottlenecks) and network issues (delivery bottlenecks) started to appear. Initially, point solutions such as proxy caches, SSL optimizers, compressors and others were employed, but these were just “band-aid” attempts to keep operations running. Applications kept growing in complexity, deployment scale, and geographic reach. And fixing one problem just uncovered another. For example, users in remote offices were first constrained by available network bandwidth. Yet once bandwidth was upgraded, network latency became the main issue affecting web application performance.



New bottlenecks impact Web application performance

### Solution Taking the Guesswork Out of Web Application Performance Problems

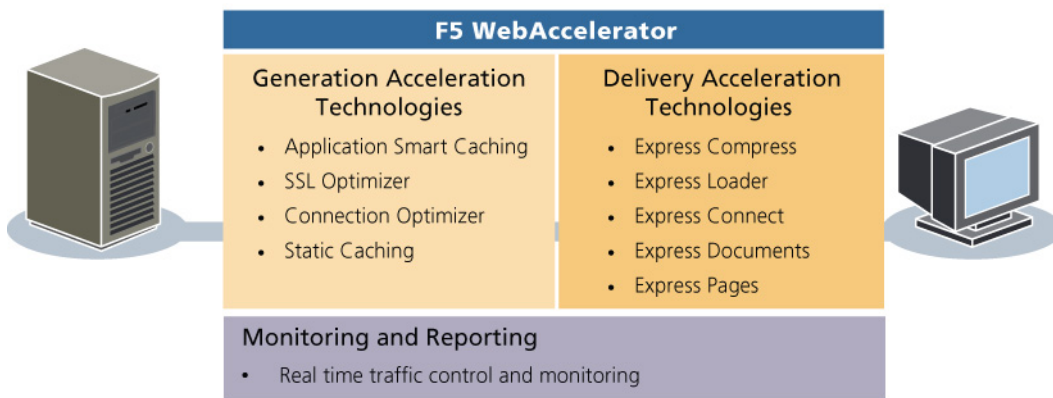
The F5 WebAccelerator applies several proprietary technologies in concert to maximize the performance of web pages, applications, and portals delivered to intranets, Internet and extranet users. Taken separately, each can dramatically improve page download speeds. But by working together as the WebAccelerator, these technologies can accelerate the overall performance of customer-facing Web sites or internal web-enabled applications, and do it more efficiently than buying and deploying various individual point products ever could.

The WebAccelerator is a highly optimized and scalable server-based solution that analyzes and intelligently processes browser requests and server responses. Unlike other solutions, it handles *both* dynamic application logic and static content in order to quickly process requests. This offloads the origin web site infrastructure by as much as 80% with typical applications, and significantly reduces application latency. User performance is further improved by a combination of technologies that compress content, eliminate content freshness requests, and maximize usage of network and server resources. The result is dramatic improvements in user download times. Now pages that would normally take 10 or more seconds to download simply take a few seconds, even

over slow dial-up lines.

### WebAccelerator Application Smart Technology

WebAccelerator delivers next-generation application advances by implementing “application smart” optimizations. Contrary to other solutions that focus on improving the performance of individual objects or connections, WebAccelerator takes an application-centric approach. Its next generation technologies optimize the end-to-end user experience as measured by how quickly full pages and documents are rendered by a browser. It also works by reducing the number of network round trips, speeding network requests, and using browser and edge caches for static and dynamic content.



The F5 WebAccelerator includes generation and delivery optimization technologies

## Optimization Technologies

### Application Smart Caching

Application smart caching (ASC) completely changes the caching model, making it possible to cache a much broader variety of content including highly dynamic web pages and XML objects. This patented technology is completely unique to F5 and unavailable from any other vendor.

ASC focuses on application logic and behavior, not just individual web objects. By describing an application’s high-level logic (what can and cannot be cached, what events cause invalidation, etc.), the WebAccelerator eliminates repeated processing of complex web requests. Application smart caching enables the WebAccelerator system to decide when to invalidate objects and how to identify reusable pieces of content. This is made possible by an intuitive user interface, a powerful XML-based API, and an HTTP request-based triggering facility that together provide comprehensive controls for validating and invalidating content.

Without WebAccelerator and ASC, the existing caching solution has only the object expiration date as a guide. ASC enables the cache to look at anything in an HTTP request—from URLs to cookies, query parameters and other headers—and produce “smart” invalidations and cache keys. Thus WebAccelerator has solved the seemingly impossible problem of caching dynamic content by implementing two key capabilities:

- A cache invalidation mechanism triggered by application and user events.
- A sophisticated matching algorithm that links fully qualified user queries to cached content.

When it comes to high-use applications, a typical static cache can only respond to 20% of HTTP



requests. This is because most applications are complex in nature, requiring heavy interactions with other applications and databases—object caching demands that static cache solutions simply cannot handle. But by leveraging ASC, WebAccelerator software can directly respond to up to 80% of the most computationally “expensive” user requests without involving the rest of the site infrastructure.

### **SSL Acceleration**

The most important web interactions involve confidential or sensitive information. Yet today these interactions are penalized by heavy latency due to the encryption and decryption overhead typically associated with secure socket layer (SSL) connections. Therefore, a complete acceleration solution must include comprehensive and flexible support for SSL. The F5 WebAccelerator brings the same performance benefits to SSL traffic as it does to standard HTTP traffic, without requiring any changes to your security infrastructure.

### **Accelerating High-Value Transactions: Key Benefits**

SSL is fully integrated with the F5 WebAccelerator. In addition to the different deployment options described below, it can be configured to apply unique policies to any part of the SSL traffic independent of the rest of the site.

#### **Flexible SSL Configuration**

Every company has different security requirements depending on existing network topologies, internal security policies, and other considerations such as physical locations and accessibility of servers. The WebAccelerator can be configured in a variety of ways in order to meet the different security demands of the modern enterprise:

- SSL termination without re-encryption to the origin server
- SSL termination with re-encryption to the origin server
- As a tunnel

#### **Connection Optimization**

Enterprise web applications spend precious cycles servicing network requests from users that involve opening and closing connections. Even though each connection’s overhead is small, in aggregate they affect the overall application load, especially with e-commerce sites or with enterprise applications deployed to a large number of users.

Connection optimization moves the responsibility of handling these connections to the F5 WebAccelerator. Network traffic is multiplexed across a small pool or persistent connections between the WebAccelerator and the origin application. The result is a significantly reduced load on the origin application.

#### **Static Caching**

Static caching is an extension to WebAccelerator’s application smart caching capability. Static caching simply serves objects—typically images, javascript, stylesheets—as long as they haven’t passed their expiration date. Even though static caching is likely to already exist in an application’s computing infrastructure, enabling the WebAccelerator to serve static objects removes another overhead operation from the origin application.



## Delivery Optimization Technologies

### Express Compress

Application and network latency issues contribute to a further slow-down of web content delivery. WebAccelerator's patent-pending Express Compress technology eliminates the latency introduced by compression algorithms, providing an additional measure of performance improvement for both dialup and broadband users. In fact, Express Compress speeds content to dial-up users five to ten times faster than before, while reducing bandwidth utilization and costs by 70-80%.

With faster response times, users are satisfied, employees are more productive, and web-enabled applications are more widely adopted. And the savings in lower bandwidth costs alone—especially involving remote sales offices or employees—can pay for the investment in WebAccelerator many times over.

### Express Loader

The majority of upstream requests simply check the validity and freshness of embedded objects and heavy images. This introduces unnecessary latency that contributes to application performance problems. WebAccelerator's Express Loader technology eliminates the vast majority of upstream content freshness requests, dramatically reducing page load times and network traffic.

When the content changes, the WebAccelerator directs the browser to the newer version and the correct content is always maintained. If the content has not changed, it immediately instructs the browser to load the old version from its local cache.

As a result, pages load faster and HTTP connection handling overhead decreases by up to 90%. Plus, traffic between the user and web server is dramatically reduced, significantly improving download speeds by 10x or greater, even for dial-up users.

### Express Connect

Express Connect upgrades the standard browser-to-server connection from the equivalent of a one lane dirt path to a super fast interstate highway. Instead of each browser request waiting in line for the previous one to return, requests and responses are sent in parallel over the wire to the F5 WebAccelerator. Since the F5 WebAccelerator is highly efficient and has a lot of available cycles, it can start processing these requests immediately, in most cases without involving the origin server. Available server scalability and bandwidth capacity is therefore optimally used. And users notice even more gains in performance.

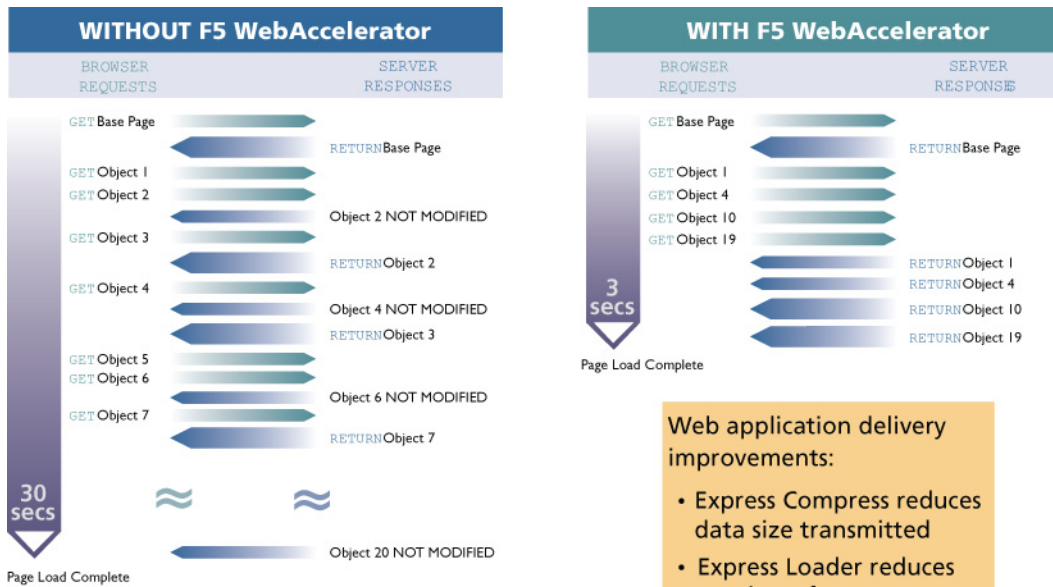
### Express Documents

Express Documents streamlines the task of working and collaborating with documents such as Word, PowerPoint, Excel, PDFs, and others. Express Documents leverages edge and browser caches to accelerate both storage and serving of frequently accessed documents without affecting document accuracy.

Additionally, WebAccelerator enables HTTP "range requests", thereby allowing large documents to be downloaded in parts and displayed immediately instead of waiting for the full download. Complex documents such as large PDF files can now be rendered in seconds, dramatically improving the user experience.

## Express Pages

Express Pages leverages the fact that, even in dynamic applications, a user might view the exact same page more than once as s/he is “clicking around” an application. Even though the page might contain personalized and dynamic information (therefore not cacheable by other optimization solutions), if none of that information has changed between the two visits, Express Pages will leverage the browser and edge caches to instantaneously serve that page.



Express technologies solve delivery bottlenecks

**Web application delivery improvements:**

- Express Compress reduces data size transmitted
- Express Loader reduces number of network roundtrips
- Express Connect increases concurrent number of requests and responses

## Monitoring and Reporting

The Performance Monitor enables real-time monitoring of site traffic, enabling enterprises to fine-tune the site’s performance. It seamlessly integrates with other log analysis or web analytics tools, and can be used to monitor any number of applications.

## Flexible Deployment Options

### Symmetric and Asymmetric Deployments

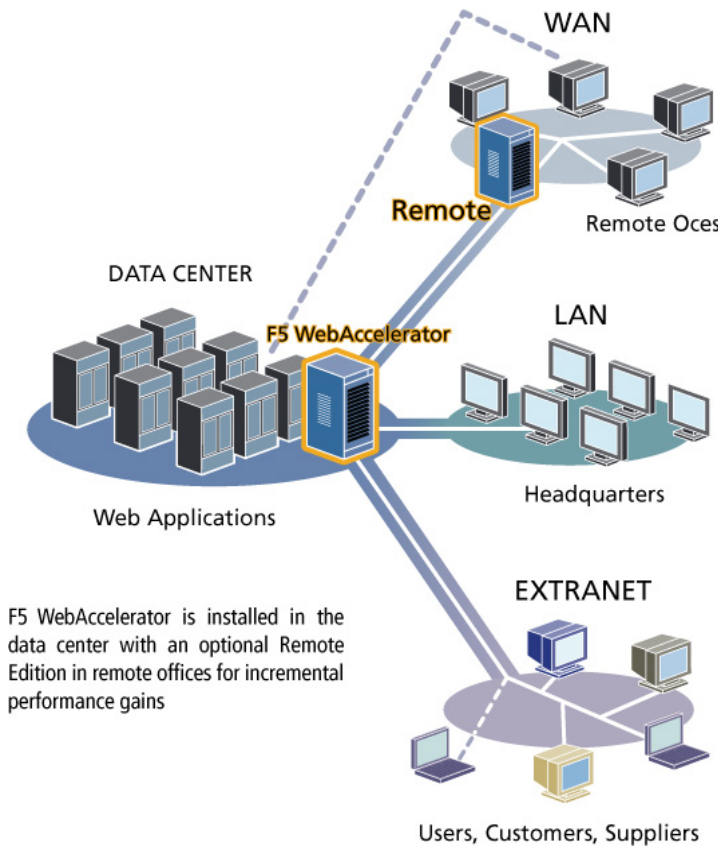
The WebAccelerator was designed from the ground up to support a variety of real world deployment configurations in order to meet the specific scalability, reliability, and performance needs of the enterprise. WebAccelerator also offers an optional add-on for remote offices (the F5 WebAccelerator Remote Edition). Installed in selected remote office locations, it analyzes and intelligently processes user and application requests as they transit between itself and the WebAccelerator in the main data center. This enables remote users to realize the same level of performance and efficiency their counterparts at headquarters enjoy.

The WebAccelerator Remote Edition reduces the need for replicated file systems, expensive network equipment upgrades, and incremental monthly network bandwidth costs. Plus, it

accelerates user application adoption and dramatically improves overall productivity.

**Compatible With Today’s Enterprise Environments**

WebAccelerator works with virtually any combination of site architecture components. These include e-commerce software, application servers, database software, and portal and content management software. It is installed on a single, inexpensive off-the-shelf Linux server compatible with most enterprise environments, offering IT personnel substantial flexibility. And for even more increased performance and reliability, additional WebAccelerator solutions can be deployed on other Linux servers, all featuring seamless integration with the existing enterprise infrastructure.



F5 WebAccelerator is installed in the data center with an optional Remote Edition in remote offices for incremental performance gains

**Easy to Install**

The WebAccelerator software requires no changes to web applications or site infrastructure, little training time, and no specialized programming skills. It can generally be configured in less than a few hours. With the WebAccelerator’s intuitive user interface, the site administrator simply provides a high-level description of the site’s behavior. This behavior can include such factors as which parameters, cookies, and header fields are significant for differentiating content, and what mechanisms are used for managing sessions and tracking users. Unlike highly intrusive point solutions that may require weeks or months to re-code or re-tag the site, the F5 WebAccelerator imposes no modifications of site architecture, applications, or code.

**About F5** F5 Networks is the global leader in Application Delivery Networking. F5 provides solutions that make applications secure, fast and available for everyone, helping organizations get the most out of their investment. By adding intelligence and manageability into the network to offload applications, F5 optimizes applications and allows them to work faster and consume fewer resources. F5’s extensible architecture intelligently integrates application optimization, protection for the application and the network, and delivers application reliability – all on one universal platform. Over 9,000 organizations and service providers worldwide trust F5 to keep their applications running. The company is headquartered in Seattle, Washington with offices worldwide. For more information go to [www.f5.com](http://www.f5.com).