



PERFORMANCE SIMPLICITY

FOR THE **INTERNET**
TO TRULY **EVOLVE**
AS MANY
FORECAST, A **KEY**
PROBLEM MUST
BE **RESOLVED:**
RESPONSE TIME.

NETWORK NECESSITY

INTERNET

A WORLD-CHANGING TECHNOLOGY

THE INTERNET REPRESENTS THE MOST SIGNIFICANT COMMUNICATIONS REVOLUTION SINCE THE ADVENT OF THE TELEPHONE. PEOPLE AND BUSINESSES WORLD-WIDE CAN NOW COMMUNICATE, ACCESS INFORMATION, PURCHASE PRODUCTS, AND EXECUTE TRANSACTIONS ONLINE.

EVEN WITH ITS UNPARALLELED GROWTH, THE INTERNET IS REALLY IN ITS INFANCY. FORRESTER RESEARCH ESTIMATES THAT E-COMMERCE REVENUES WILL RISE FROM \$50 BILLION IN 1998 TO 1.4 TRILLION BY 2003. THE INTERNET IS PROJECTED TO BECOME THE PRIMARY MEDIUM FOR CONSUMER AND BUSINESS COMMERCE, ENTERTAINMENT, EDUCATION — AND THE LIST GOES ON.

THE E-COMMERCE ARM OF ONE OF THE WORLD'S LARGEST TRANSPORTATION COMPANIES IS ABLE TO PROCESS 10X MORE CUSTOMER TRANSACTIONS DUE TO CACHEFLOW'S TECHNOLOGY.

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THE LIGHTNING-FAST WEB PERFORMANCE DELIVERED BY CACHEFLOW ALLOWED A BROADBAND SERVICE PROVIDER TO BUILD A NATIONWIDE SUBSCRIBER BASE AND ATTRACT TOP-QUALITY PROVIDERS.

NOT QUITE SO FAST

For the Internet to truly evolve as many forecast, a key problem must be resolved: *response time*. It has been understood since the very earliest computer systems that a sub 2-second response time is critical to human productivity. In this channel-flipping culture, the mind quickly wanders or simply moves on to something else when there is a noticeable lag. Anyone who has spent time on the Web knows that a sub 2-second response is highly rare, with the average being closer to 10-15 seconds.

The distributed nature of the Internet, its greatest strength, is also its greatest weakness. Since no party controls how the Internet is constructed, performance is highly variable. The average request makes 19 network "hops" before reaching its final destination, according to Internet Research Group. No matter how fast a company's internal network, or how fast a connection the consumer has in the home, a request must traverse the Internet through these various points and is subject to inefficiency or congestion along the way.

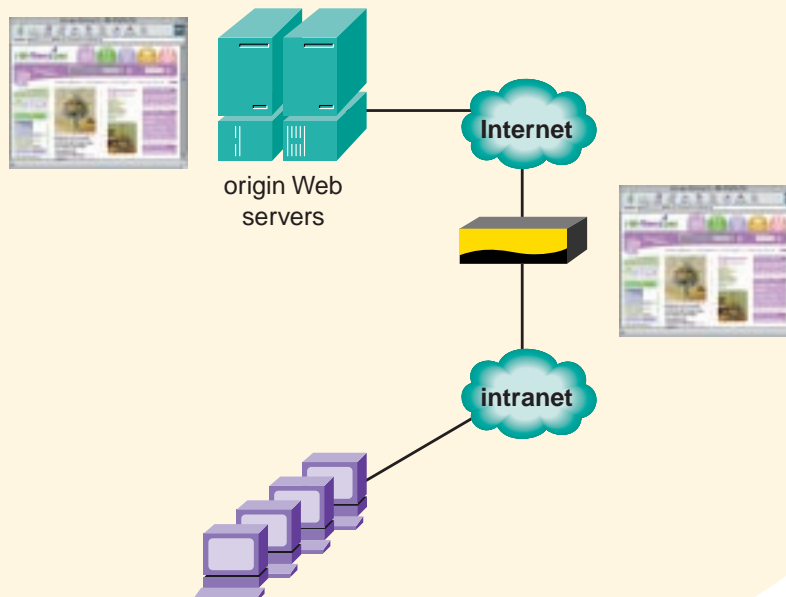
Further, downloading Web pages is a highly repetitive process. Pages are really a collection of objects—pictures, logos, text, and buttons. For each object, two round-trips between the browser and the server are required: one to establish a TCP connection and another to complete the data transfer using HTTP. With 10-20 objects in an average Web page, the sheer number of round-trip connections creates latency. Furthering the problem, it is very common for the requesting client and source server to be thousands of miles apart. So along with the number of network components each request must pass through and the number of round-trips required to fetch the objects in a page, the *speed of light* causes physical delays that can only be overcome with a different approach.

PERFORMANCE

BRINGING CONTENT CLOSER TO USERS

It's intuitive that response time can be greatly reduced by moving content closer to users, eliminating the need for each request to make an Internet journey.

CacheFlow® Internet caching appliances intelligently perform this function, greatly speeding Web access. These smart devices sit at network boundaries, capture Web content, and deliver it directly to users' browsers upon demand. Web page requests no longer have to travel the Internet to be serviced. When data is managed on a CacheFlow appliance, the desired sub 2-second response time becomes a reality. In today's fast-paced, highly competitive Web environment, *caching has become a network necessity*.



GREAT WEB PERFORMANCE - NO HEADACHES

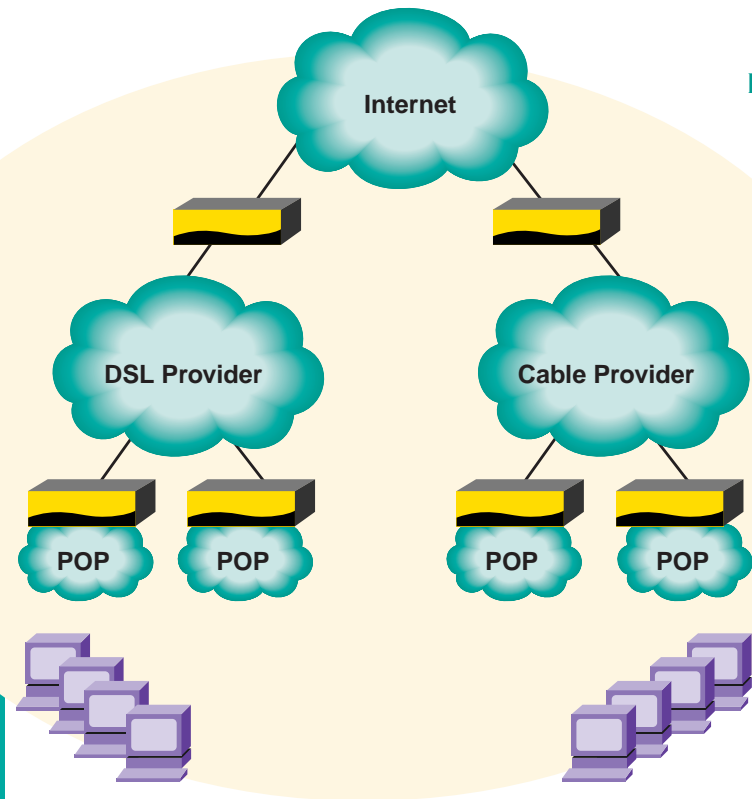
CacheFlow's appliances are highly intelligent. Each appliance is based on CacheOS™, a patent-pending operating system designed expressly for Web caching. CacheOS is built for speed, reliability, content freshness, and ease of management. Through CacheOS, the appliances determine what data to store, when it should be purged, and how often it should be checked for updates. After a 4-step installation process, the appliance "just runs" without requiring intervention and tuning. CacheFlow's Internet caching appliances deliver:

- *Speedy access to Web pages* - up to a 20 times performance improvement
- *Bandwidth savings* - 70% cache hit rates are common, with bandwidth usage reduced commensurately

- *Content accuracy* - based on a Web object's popularity and rate of change, the appliance performs background checks which ensure that only the latest, most accurate content is delivered
- *Carefree management* - the appliance is self-tuning and provides automatic notification of any problem conditions
- *High reliability* - optimized CacheOS is lightweight and sturdy; if problems do arise, the appliance will reboot itself in less than 10 seconds
- *Seamless interoperability* - connect to a router or Layer 4 switch; Cache is transparent to all clients and servers
- *Infrastructure offloading* - overburdened server and firewall resources are relieved as the cache appliance handles most of the requests

CacheFlow's award-winning family of appliances range from the entry-level to the high-end, offering graduating levels of throughput and content storage. This flexible approach ensures that the right level of performance is available at the right price.

SIMPLICITY

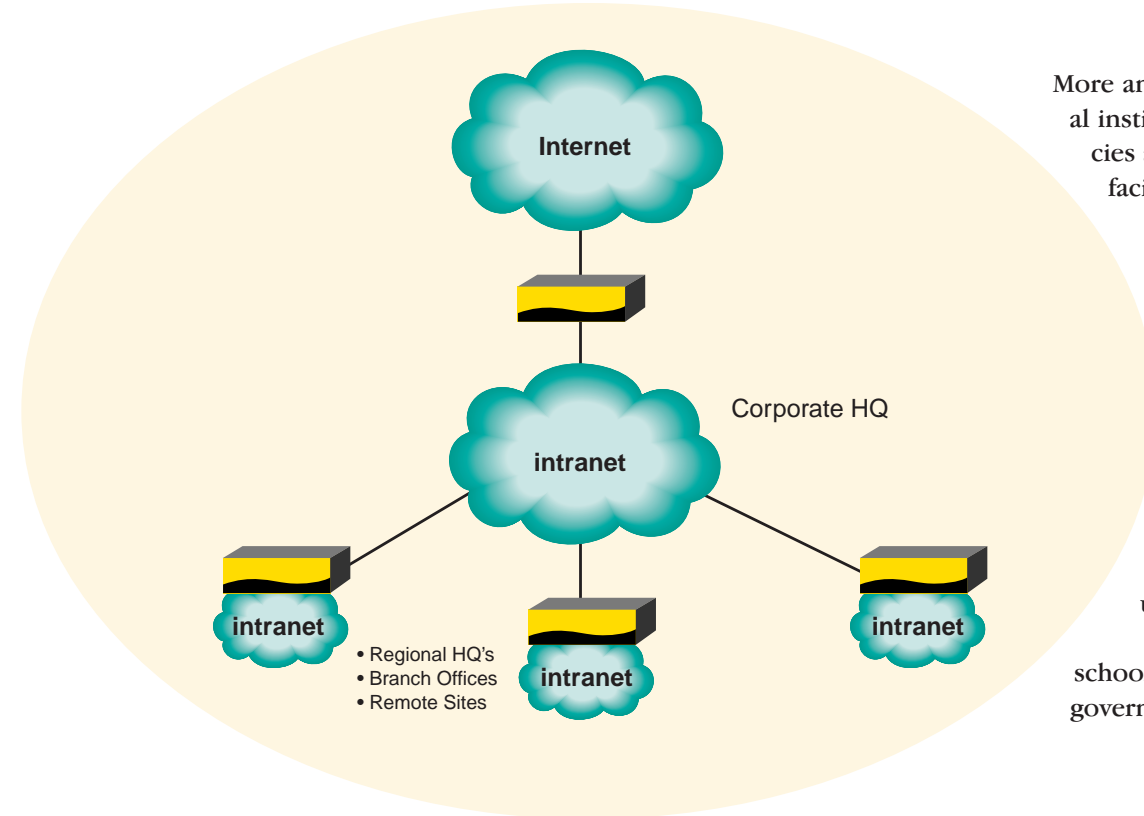


HELPING INTERNET SERVICE PROVIDERS GROW THE SUBSCRIBER BASE

The success of an ISP, whether a dial-up or broadband provider, rests with its ability to attract and retain customers. Nothing will further those objectives more than offering great service, specifically *great-performing* service. For an ISP, deploying Internet caching appliances within the network is the key to delivering great performance and growing the business.

ISPs install CacheFlow appliances at POPs to move data closer to their subscribers. In a majority of cases, user requests can be serviced directly through the cache without hitting the Internet. It's a win-win situation. Users receive snappy performance and are delighted with their ISP; ISPs spend less on bandwidth since fewer requests pass through carrier networks.

NETWORK NECESSITY



HELPING ORGANIZATIONS MAXIMIZE WEB PRODUCTIVITY

More and more companies, educational institutions, and government agencies are utilizing Web technology to facilitate communication, increase efficiency, and lower costs. To achieve these goals, Web-based applications are being deployed at a rapid rate. With this increasing dependence on the Web, the network and server infrastructure is becoming strained. This problem is compounded for those organizations that are geographically distributed: companies with multiple divisions and regional offices, schools with multiple campuses, and governments with locations around a country or around the world.

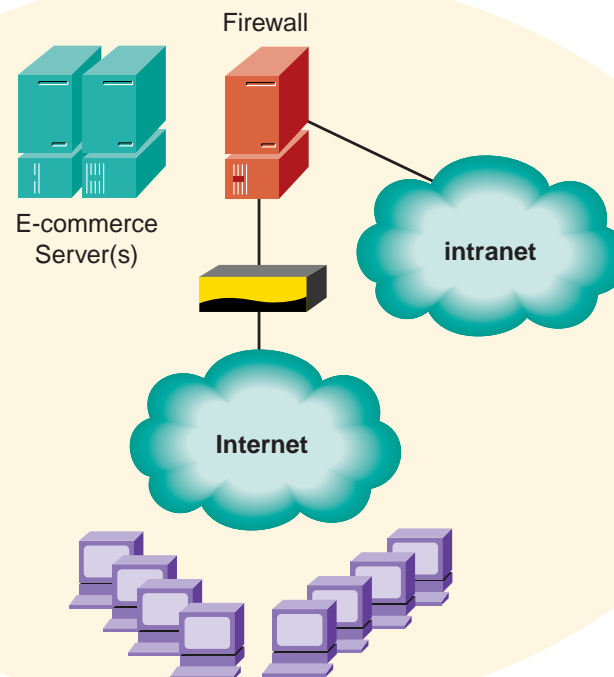
Internet caching appliances from CacheFlow will capture content locally and reduce the need for a request to travel to a central intranet or to the Internet. Using CacheFlow will minimize the impact on the infrastructure and provide users with that rapid response so critical to productivity. CacheFlow enables the deployment of Web technology as organizational needs dictate. Limitations are removed and opportunities can be fully exploited.

DELIVERING MORE THAN DATA - RESULTS

If the Internet hasn't already reshaped something—a business, a process, an interaction—it soon will. CacheFlow's Internet caching appliances help organizations capitalize upon the dramatic effect of these changes. It doesn't matter what specific Web benefits you're seeking—to attract and retain customers, to create new sales channels, or to increase organizational knowledge and productivity—CacheFlow delivers results.

HELPING E-COMMERCE BUSINESSES INCREASE SALES

As dot-coms focus on attracting customers to their sites, it is critical to understand that this is only the first step. It's more important to ensure that the customer has a successful E-commerce experience once they arrive on the site. A key success factor to this experience is response time. For example, say a customer is attracted to a banner ad for an online music store and clicks on the banner. If the site takes too long to display, the user is highly likely to cancel the operation. This click-through resulted in zero revenue and an unfavorable impression. The same issues can arise when trying to review product offerings or consummate a transaction. According to a study by Zona Research, 8 second response is the tolerance point. Anything slower, and customer exit rates soar.



Internet caching appliances can help. When deployed at E-commerce sites, CacheFlow systems will serve a bulk of the objects requested, greatly offloading back-end servers. In one case, an E-commerce operation found that 92% of its site traffic was handled by a CacheFlow appliance. The other 8% consisted of transactions that were passed to the application and database servers. The result: the site can now handle 10 times more requests than before CacheFlow.

“OUR EDITOR’S CHOICE, THE CACHEFLOW, PROVIDES EXCELLENT PERFORMANCE AND IS THE HANDS-DOWN WINNER IN TERMS OF MANAGEMENT.”

PC MAGAZINE
CACHE SERVER REVIEW
SEPTEMBER 1999

“CACHEFLOW HAS HIT THE NAIL ON THE HEAD. DEDICATED NETWORK CACHES OF VARIOUS SIZES WILL BE AS COMMON IN ENTERPRISE NETWORKS AS IP ROUTERS, AND CACHEFLOW CACHES REALLY DELIVER SOLID PERFORMANCE GAINS.”

DAVID STROM
INDUSTRY ANALYST
AUGUST 1999

CacheFlow Inc. is a leading provider of Internet caching appliances that accelerate and manage the flow of information over the Internet. CacheFlow products contain CacheOS™, a proprietary high-performance operating system. CacheFlow Internet caching appliances enable Internet service providers and enterprises to reduce Web response times, easily manage and administer their networks and reduce overall network costs. In addition, CacheFlow Internet caching appliances are designed to provide better network security and more up-to-date content than traditional caching solutions.

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