Netra Proxy Cache Server

Product Overview

Businesses today are becoming increasingly dependent on Internet technologies for information access. Implemented internally as Intranets, these technologies facilitate the distribution of information within the organization. Intranet-based information made available to selected users outside the organization (as extranets) facilitate communication and cooperation with business partners. And the public Internet provides access to all sorts of information (current events, financial information, market intelligence) that can help an organization make decisions and gain competitive advantage. Web caching can help these organizations reduce the costs of this access and improve the availability of content to their users in a timely fashion.

Many organizations have further embraced Web technology-electronic commerce-as a fundamental part of doing business. These businesses range from those that use the Web as an extension of the storefront or mail-order catalog (Amazon.com, Lands End), to companies who place some of their core business functions on the Web (FedEx, UPS), to companies who seek competitive differentiation by deploying Web-based services (Citicorp, Merril-Lynch, Dow Jones). Finally, there are the organizations whose business **is** the Internet-service providers (ISPs and Telcos) who are in the business of providing Web connectivity to businesses and end-users (ATT, PacBell, AOL).

For all these organizations, fast, cost-effective access to Web content is critical. However, because the needed content is frequently located remotely from the user, access requires the use of wide area network resources. These resources are expensive, have finite capacity to service ever-growing demands, and as a result are often congested.

For the consumers of Web content, access problems are costly not only in network resources, but also in lost productivity if response times are long or users cannot access the information they need. For ISPs and content providers, access issues limit their ability to maximize the number of users they can accommodate at the highest quality of service given a reasonable cost of doing business.

Reducing the need for long-distance (wide area) access for frequently-used content can go a long way to solving these problems. The Netra Proxy Cache server is designed to do exactly that.

The Web Caching Solution

Web caching servers such as the Netra Proxy Cache place frequently used content (Web pages and other files) closer to the users so that repeated accesses are local, (and thus inexpensive and fast) rather than requiring a remote access via the relatively slow and expensive wide area network. The goal is to reduce both the time required and the costs of accessing content.

· Eliminating even a small percentage of remote accesses can help reduce WAN congestion, and makes the WAN bandwidth available for other uses and/or other users. It means that the organization can provide the desired quality of service at a lower level of bandwidth capacity than would otherwise be the case, thus saving in circuit costs.

· Local access is faster (often significantly faster) than WAN access, depending on network latency, degree of congestion, etc. This helps end-users be more productive more quickly, especially users in remote offices or departments. For content and service providers, this means they can service more users at a higher quality of service.

The Role of the Netra Proxy Cache

The Netra Proxy Cache functions as an invisible intermediary between a client browser and the remote servers that provide content. Its purpose is to provide a content source that is closer to the client-that can reduce the need to go out across the relatively expensive WAN to access frequently-used content. Once a document has been retrieved from the original source (via the WAN) and cached on the Netra Proxy Cache, subsequent users can retrieve the same page with a local access. This improves the response time for those users and reduces the number accesses across the wide area network.

The Netra Proxy Cache server is a full-featured, dedicated proxy/caching server based on high-performance UltraSPARC servers. The Netra Proxy Cache’s load balancing and automatic, user-transparent fail-over features mean that the proxy/caching service will continue to be available under peak load conditions or in the event of hardware or software failures. The Netra Proxy Cache software can also extend this reliability and availability over multiple Netra Proxy Cache servers. "On the fly" scalability and ease of deployment and management make the Netra Proxy Cache a very cost effective solution as an organization’s needs grow.

A web caching solution must be high performance, transparent to both the users/clients and to the content servers, not impose arbitrary limits on the amount of information that can be cached, and be flexible in its schemes for refreshing cached content. It must support secure communications (SSL), be easy to install and manage, and allow for easy expansion (scalability). The Netra Proxy Cache easily meets all these requirements.

Whenever a user asks for Web content, the request is sent to the Netra Proxy Cache to determine whether the content has already been cached. If so, the Netra Proxy Cache provides the content to the user. If not, the Netra Proxy Cache retrieves the content from its original source, provides it to the user who requested it, and caches it in case another user needs it. All this activity must be transparent to the user.

Because the Netra Proxy Cache server sits between the user and the content that the user needs, it is important that the caching server does not in itself become a bottleneck. Availability and reliability of the proxy/cache service is critical, as is the ability to expand capacity as needs grow. The software provided with the Netra Proxy Cache addresses all these concerns.

· The Netra Proxy Cache’s load balancing and automatic, user-transparent fail-over features means that the proxy/caching service will continue to be available under peak load conditions or in the event of hardware or software failures. In an array of caching servers, the Netra Proxy Cache software monitors the health (availability, load, and presence of server processes) on each Netra Proxy Cache in the array, and manages the Netra Proxy Cache servers to assure users of continuous, reliable service.

Service failover is automated and completely transparent to users.

"On the fly" scalability and ease of deployment and management make the Netra Proxy Cache a very cost effective solution that can easily be expanded to add capacity as an organization’s needs grow. The Netra Proxy Cache software enables multiple Netra Proxy Cache servers to function together to provide a single proxy/cache service. When you add Netra Proxy Cache servers to a proxy/cache group, they become instant siblings, extending the cache to the additional machines.

The Netra Proxy Cache Server Features

The Netra Proxy Cache is a full-featured, dedicated proxy/caching server. The Netra Proxy Cache hardware platform is based on high-performance UltraSPARC servers. The Netra Proxy Cache software provides a set of proxy/ cache features that is competitive with currently available solutions from other vendors. In addition, the Netra Proxy Cache extends the reliability and availability of the Netra Proxy Cache service over multiple Netra Proxy Cache servers.

The Netra Proxy Cache easily meets all the requirements for a web caching solution. These requirements include:

· high performance

· transparency to both the users/clients and to the content servers

· the ability to balance load to maximize response

· support for service fail-over

· ease of installation and management

· ease of expanding capacity (scalability)

· no arbitrary limits on the amount of information that can be cached

· flexibility in its schemes for refreshing cached content

· support for secure communications (SSL)

The Netra Proxy Cache is a dedicated proxy/cache server-a complete hardware/software solution tailored specifically to function as a proxy/cache service. It can be deployed with a minimum of effort and expertise, using a browser-based interface for installation, configuration and administration. It is also easy to expand capacity by adding additional servers as needs grow.

The Netra Proxy Cache software provides scalability, reliability, manageability. This allows new ISPs to deliver the same uncompromising quality of service that telco's have been known for throughout the years.

High-Performance

Because speed of the proxy/cache service is an important factor in overall user response, a high-performance hardware platform is needed. The Netra Proxy Cache family of products are based on the high-performance UltraSPARC hardware platform. The Netra Proxy Cache server is deployed on the Ultra-30 platform, with an UltraSPARC-II 250 MHz CPU, 128Mb of memory, and 2x4.2Gb disk drives. The Ultra-30 also has:

· UPA provides a crossbar-oriented interconnection establishing a 144-bit wide, ECC-protected data path to the CPU

· Clocked at 100 MHz, it gives a peak throughput of 1.6 GB per second

· New memory subsystem offers dual, 288-bit-wide memory paths with an interleaving feature for improved system performance

· Flexible architecture allows memory to be installed in pairs for 288-bit-wide memory path or in sets of four to utilize the dual 288-bit-wide memory path interleaving feature

· New UltraSCSI Fast/Wide SCSI is integrated on the motherboard, offering double the disk performance (40 MB per second) of the current Ultra 1 or Ultra 2 systems

The hardware configurations include two disks for optimal performance, balancing needs for caching, proxy logging, and standard Solaris logging. They also include two network interfaces to support an out-of-band mechanism for monitoring the service status.

In addition, the Netra Proxy Cache supports the Inter Cache Protocol (ICP) for fast communication between siblings/parents in a multi-machine cache hierarchy, speeding searches of distributed cache configurations.

Scalable, Load Balancing, and Reliable

The Netra Proxy Cache software enables multiple Netra Proxy Cache servers to work together to provide a single proxy / cache service. It also enables the "on-the-fly" addition of new Netra Proxy Cache servers as "instant siblings" in an array of caching servers. The Netra Proxy Cache software allows configuration in hierarchical or sibling relationships, expanding the reliability and availability of the proxy/cache service across multiple hosts.

The Netra Proxy Cache software monitors health (availability, load, presence of server processes) of hardware and proxy/cache service on each machine using an isolated "control network" across a second network interface. This out-of-band mechanism avoids the complexity of having to examine every packet (in-band techniques).

The Netra Proxy Cache implements an intelligent DNS-based load balancing methodology. It monitors service loads, and detects threshold overloads. Client requests are routinely sent to the least-loaded host. The software can even remove a host from DNS temporarily to control load.

When the Netra Proxy Cache software detects a problem, it remaps the service onto another host, transparent to client, with no interruption of service to client. The Netra Proxy Cache provides any-to-any fail-over among the hosts in a caching server array, meaning there is no single point of failure.

Easy to install and manage

As a dedicated server solution, the Netra Proxy Cache is easy to install and administer using a browser-based installation and configuration interface. The Netra Proxy Cache server can be initially configured and deployed via an installation utility that writes the associated network identity to a floppy. Upon boot, the contents of the floppy is used to configure the network identity of the server. Once on the net, the Proxy/Cache server can be further configured via any browser, from any client.

The HTML/cgi-bin interface guides the administrator in configuring the Netra Proxy Cache server as a stand-alone or as part of an array of Netra Proxy Cache servers. This flexibility and ease-of-use allows the server to be quickly deployed and integrated into an existing network. This HTML interface simplifies the administration of a very sophisticated device and takes advantage of the high-performance, scalable, reliable Solaris Operating System.

The HTML interface allows the administrator to deploy the server to remote sites and to administer, monitor, and manage it via the network. Monitoring tools keep track of the state of the server and of the Proxy Cache service. It also highlights the inter action of all servers that are part of a deployed array. Auditing features of the server allow the administrator to query hit statistics, detailed user access logs, bandwidth usage, and a number of other proxy- and cache-related statistics.

The Netra Proxy Cache also ships with an SNMP agent and MIB, enabling management from an SNMP-conformant management platform, such as the Solstice Enterprise Manager. The server supports a set of traps that notify the administrator of critical events, ranging from a down server to a failure report on a server component.

How the Netra Proxy Cache is Used

Web caching is an important resource in both an end-user environment (within organizations where the primary benefit of Internet/Intranet access is as a consumer of content) and in an ISP or content provider environment, where the primary focus is on making content or access to content available to "customer" users. The benefits of caching are similar in all of these types organizations, but are prioritized somewhat differently.

Internet Service Providers

Internet Service Providers, (ISP's) are companies who are in the business of providing Web connectivity to business customers and end-users.

For an ISP, the major concern is providing the most competitive service offering to its users by maximizing availability, reliability, and providing the best possible response times, at the lowest possible cost. For an ISP, the issue is not whether proxy/ caching is valuable, but rather which solution is the most cost effective.

An ISP (or Telco) services requests from users for content, obtains it and sends it on to the client/user. If the requested content is not found locally (within the ISP's network), the ISP must send the request out over the public Internet to retrieve the content. At this point, the request is making use of a finite resource (the ISP's connection into the Internet cloud). This adds cost to satisfying the request, slows down the response to the user, and can become a bottleneck that limits the number of re quests the ISP can service at any one time.

Clearly, an ISP derives a significant benefit from satisfying requests locally. Caching servers for commonly-accessed content saves on expensive and time-consuming access over Internet, enables faster response times for users, and allows more users to get their "share" of the (limited) Internet access resources. Thus, an ISP typically would set up groups of proxy/cache servers ("cache farms") to cache commonly used content.

For an ISP, the major concern is providing the most competitive service offering to its users by maximizing availability, reliability, and providing the best possible response times, at the lowest possible cost. Proxy/caching is therefore extremely import ant and valuable. Faster access to data at lower bandwidth costs is a significant competitive advantage.

With the following configuration, an ISP can deploy a Netra Proxy Cache array that will help to minimize the traffic sent across the router to it's Local Exchange Carrier (LEC). Reducing the amount of traffic across this link, usually a very expensive link such as a T1, T3, or more, can help reduce costs to the ISP, can improve the perceived performance of the network to the clients, and can allow the ISP to support more clients across it's Internet connection.

Netra Proxy Cache Server for Internet Service Providers

For an ISP, a cost-effective proxy/caching solution enables:

· More competitive service offerings: they can provide faster Web access at no additional connectivity costs to customers.

· A more efficiently run business: they can provide these services through optimizations in their networking architecture, not at the expense of adding more bandwidth. This protects their investment in and enables better utilization of their WAN capacity.

· Continuous availability and reliability: minimize down time and increase availability of Web content.

· Scalability: the ability to respond to quickly to sudden increases in web access by customer base.

The Netra Proxy Cache server delivers the following benefits to ISPs and Telco customers.

· Delivers faster, better, Web access (through cost-effective groups of high-performance, highly efficient Netra Proxy Cache servers)

· Delivers uncompromising reliability (through the load-balancing and fail-over capabilities of the software)

· Enables service providers to run their business more efficiently (the Netra Proxy Cache helps utilize networking resources better with the ability to add capacity only when and where you need it, and with load-balancing and fail-over to assure availability and reliability)

· Enables rapid deployment of additional Netra Proxy Cache servers to scale services (new members of a caching server group immediately become part of an expanded proxy/cache service)

· Is easy to install, and easy to run and manage with it browser-based administration GUI.

· Provides very fast performance for data access due to high performance servers and efficient Inter Cache Protocol for communication between members of groups of distributed caching hosts

· Functions as a component of managed networks, including management of proxy/caching resources, and support for a SNMP agent/MIB

The Global Enterprise

Organizations in this category are those that build Web access into their internal infrastructure. Faster access to Web information sources therefore becomes a critical performance improvement.

These companies may have a distributed architecture and there fore, remote offices. For them, the faster access to information sources, both within and outside the organization, is critical as it improves productivity.

In an enterprise environment Web content is typically located remotely from the users who need it. Some content may be located on internal Web sites (the enterprise Intranet) and accessed via the corporate WAN. Other content will be external to the organization, meaning that the user's request goes over the corporate WAN to an Internet gateway and from there onto the public Internet. In either case, the enterprise wide area network is involved.

An enterprise can derive significant benefit from employing caching servers located locally to various groups of users and to remote locations. In an enterprise network, there are typically many competing demands for wide area bandwidth, and utilization of bandwidth is almost always a concern. The enterprise can gain a significant benefit by reducing the bandwidth demands due to Web access. Even a modest hit rate may turn out to be cost-effective if it helps reduce congestion on the network. In addition, in a highly-used network the response times for content access over the network may limit the productivity of the users who depend on that content to do their jobs.

In an enterprise environment, the major concern is making the most cost-effective use of existing network resources-reducing networking costs, managing congestion, improving performance-and maximizing employee productivity while being able to accommodate growth and new types of data flow.

Netra Proxy Cache in the Corporation

In a global enterprise environment, a cost-effective proxy/caching solution enables:

· Reduced networking costs: both the cost of connectivity and cost of ownership

· Accommodation for growth: the use of proxy/cache services allow new remote locations with reduced connectivity costs. Also, more efficient use of network bandwidth enables traffic growth, and also improves the quality of that traffic

· More effectively management of the network traffic congestion: reducing the demands for Web content over the wide areas helps reduce congestion, leaves network resources available for other uses.

· Continuous productivity improvement for users by removing networking issues as an obstacle The Netra Proxy Cache server delivers the following benefits to enterprise customers.

· Reduces connectivity costs by reducing the demand for WAN resources due to Web content access

· Enables CIOs to run their business more efficiently:

· Helps utilize their networking resources better, only adding capacity when and where it is needed

· Reduces cost of ownership through better utilization of their investment in network resources (including network connectivity resources, content sources, and proxy/caching services)

· Increases reliability of the network, less competition for limited resources

· Reduces traffic congestion

· Adds reliability and availability for Web content users through its fail-over and load balancing features

· CIOs can accommodate increasing traffic and still support increases in Quality of Service (QoS) because traffic congestion due to Web content access is removed as an issue

· Provides fast performance for data access-not only does the Netra Proxy Cache alleviate performance issues, but it actually can significantly improve the performance of Web content access

· Functions as a component of a managed network, including management of proxy/caching resources, and support for a SNMP agent/MIB-allows further migration into the new generation of networking

Information Access Providers

Many organizations have embraced Web technology-electronic commerce-as a fundamental part of doing business. Information access providers are those organizations who provide access to information via the WorldWide Web for their customers/clients. These businesses range from those that use the Web as an extension of the storefront or mail-order catalog (Amazon.com, Lands End), to companies who place some of their core business functions on the Web (FedEx, UPS, etc.), to companies who seek competitive differentiation by deploying Web-based services (Citicorp, Merril-Lynch, Dow Jones etc.). An information access provider's goal is either to deploy a new type of business (Web-based) or, for existing businesses, to provide more competitive, innovative and differentiated services which will result in increased marketshare or additional revenues .

As with an ISP, the major concern is providing the most competitive service offering to its users by maximizing availability, reliability, and providing the best possible response times, at the lowest possible cost. The use of proxy/caching services is not an issue, but rather which proxy/caching solution is the most cost effective.

Netra Proxy Cache on the Network

For an information access provider, a cost-effective proxy/caching solution enables:

· High reliability and availability. This is of utmost importance, as it is central to the equality of the new services or business, and is also immediately related to revenue and marketshare

· The ability to accommodate unexpected or varied patterns of traffic growth: the nature of Web-based traffic

· Cost control: for these companies it is critical to contain investment costs and project spending, and maximize utilization of its resources

· Keeping networking costs down while allowing deployment of increasingly more sophisticated services, based on Quality of Service and Cost of Service

For information access providers, the Netra Proxy Cache server delivers the following benefits.

· Allows deployment of new breakaway business strategies, which improve financial performance of companies (adding revenue or increasing marketshare)

· Maximizes the use of the organization's current investment in network and Web technology, and in the long run reduces cost of ownership (through scalability, flexibility, and the ability to add capability when needed, where needed)

· Allows continuous availability and reliability of new services (PBX quality) which is key in gaining marketshare or new business

· Is easy to install, easy to run and manage-specialized System Administrators skills can now be applied instead to other critical business areas

· Provides fast performance for data access-not only does the Netra Proxy Cache alleviate performance issues, but it actually can significantly improve the performance of Web content access

· Functions as a component of a managed networks, including management of proxy/caching resources, and support for a SNMP agent/MIB-allows further migration into the new generation of networking

Conclusion

The Netra Proxy Cache Server is a high-performance, scalable, carrier-grade network caching server that enables ISP's, Information Access Providers, and Global Enterprises to provide faster, more reliable access for their customers/users to the information needed to make real-time business decisions.

The Netra Proxy Cache:

· Delivers faster Web/network access and increases network bandwidth by reducing redundant requests

· Delivers uncompromising reliability and availability

· With on-the-fly scalability enables the addition of servers as needs grow-without powering down

· Reduces cost of ownership by optimizing access to limited network resources

· Reduces network congestion and connectivity costs

· Eliminates bottlenecks with Intelligent Load-Balancing

· Ensures uninterrupted service due to Automatic Failover, built into the software

The Netra Proxy Cache provides very high value for Internet Service Providers, Global Enterprises, and Information Access Providers alike, by enabling the fastest, most efficient access to Web-based information while minimizing costs and optimizing resource utilization. The Netra Proxy Cache is a flexible, cost-effective Web caching solution that enables the rapid deployment of new, reliable business practices on Web with high quality of service.