

## Optimizing Oracle® E-Business™ Suite with Citrix® NetScaler®

### Application Overview

Managing large enterprise operations is more complex than ever. A myriad of business operations once run largely in a geographically contained region is now dispersed across the globe. The list of system applications has grown to astronomical proportions as new regulatory requirements have commenced, manufacturing groups, vendors, and partners now interact on a worldwide basis, and global pressures force tight integration and control of management information. Fortunately comprehensive business suite software offerings have kept pace allowing effective business making decisions and ensuring optimal responses mandated in today's competitive world.

Oracle's E-Business suite is a complete offering of enterprise applications covering a wide array of business needs. The suite includes modules for just about any business need. Operations including procurement, manufacturing, finance, customer relations, marketing and sales, supply chain, maintenance, logistics and project management and many more are now tightly woven into one solution. Users can choose any or all of the suite elements. By implementing the suite, management can obtain the necessary measure of control and make informed decisions that are efficiently implemented. In every case, the application has been designed from the ground up to be fully web based with only a standard browser required for access; no client agent, java script or applets are required.

### WEB APPLICATION DELIVERY CHALLENGES

Global business operations demand that application usage originally designed to run in a local environment must work across continents with no significant hit to throughput, latency or ease-of-use. Data center consolidation, geographic dispersion of users, and the security concerns of using a public network require IT to ensure that a complex suite such as E-Business works as if the partner, supplier or employee is local. While web-based applications theoretically allow its use by anyone anywhere with a browser, in actuality many hurdles must be overcome including the following:

- Latency associated with worldwide communications results in slow user/server sessions and diminished user experience.
- Server availability and the need for efficient redirection of user requests to appropriate resources.
- Transmission inefficiencies resulting from "chatty" protocols.
- The increasing trend of the perforated enterprise security perimeter may expose web servers and web-based applications to unknown attacks.
- Minimal insight into the cause of poor performance and no "advanced warning" of limited future communications.

#### BENEFITS TO DEPLOYING E-BUSINESS WITH CITRIX NETSCALER

Citrix NetScaler can enhance application delivery for telecommuters, partners, suppliers, sales channels, and customers anywhere in the world. Oracle and Citrix collaborate on a continual basis to test applications with Citrix NetScaler to ensure optimal results. Benefits from Citrix NetScaler's integrated solution include:

- Enhanced availability of Oracle E-Business business suite applications
- Superior response times for users with up to 5x improvement
- Expanded scalability of Oracle E-Business servers
- Web application performance visibility

## CITRIX NETSCALER SOLUTIONS FOR E-BUSINESS USERS AND IT ADMINISTRATORS

### Enhanced Application Availability

**Server Load Balancing and High Availability.** Suites with numerous applications like E-Business require multiple servers to fulfill requests for data, applications and web content. Redundancy will help guarantee availability. To further ensure availability, advanced traffic management is required. Citrix NetScaler provides unparalleled capabilities to ensure application accessibility. Layer 4-7 based server load balancing automatically directs client requests to proper back-end application, database or web servers. Such servers and applications can be grouped by server, services or service groups; the latter allow the E-Business software elements to be mapped to one or more specific servers and treated as a logical entity by Citrix NetScaler. This enables each of the applications to be distinguished such that if one is undergoing an upgrade or other maintenance the other applications are not affected.

**Balancing and Health Checks Techniques.** Availability is further amplified by numerous balancing techniques and health checks. Balancing methods such as SNMP MIBs are available through a Citrix AppExpert™ user interface with no user-based programming required. Citrix NetScaler provides a variety of pre-defined, custom, or script based health check options to ensure server accessibility. If a health check fails, E-Business requests are not delayed by their direction to a failed server.

**Session Persistence Methods.** When a user session must maintain connectivity to a specific server, Citrix NetScaler provides numerous persistence methods. Techniques include sessions based on cookie, session ID, and IP address hashing ensure user sessions to the assigned server are maintained. With AppExpert no coding of session-persistence scripts are needed.

**Full Layer 7 Header/Payload Switching.** Content switching at Layer 7 provides the ultimate in intelligent traffic management where application layer information such as client type, requested URL, cookie information, and application software usage are used to optimize delivery. Citrix NetScaler provides IT management the ability to switch requests on both header *and* payload data to allow highly granular redirection of traffic.

With many customers of E-Business being large Fortune 1000 organizations, they often have worldwide deployment through various data centers. End-users can be anywhere and they still expect the same level of performance no matter where they are located. Advanced global server load balancing further improves the user experience by ensuring the closest sever responds to each request.

### Productivity through Improved Response Times

Application availability does not solely guarantee acceptable performance. Many aspects of E-Business result in worldwide usage including Sales use of customer relationship management software and intercontinental suppliers running supply chain management tools. Citrix NetScaler application delivery solutions incorporate many techniques to substantially reduce application response times for end users no matter where the user resides.

**Data Compression.** Through Citrix AppCompress™ standards-based HTTP compression accelerates the web-enabled traffic from E-Business. HTML content is not usually stored in a compressed form and application servers running E-Business do not compress information. Content including HTML text, JavaScript, and XML can be efficiently compressed by two to five times. Citrix NetScaler reduces the amount of data on the network and the number of round trips to send it. No client side agent is needed as AppCompress leverages decompression support in any browser. The result is reduced latency and lower WAN bandwidth requirements. Latency reduction up to 300 percent has been demonstrated with Citrix NetScaler.

**WAN-Side TCP Optimization.** Optimization techniques for TCP allow Citrix NetScaler to make this protocol run more proficiently and thereby reduce user wait times. Through “client keep-alive”, client side TCP/IP connections are maintained longer to minimize time-consuming TCP handshakes. “Fast-ramp” allows a dramatic acceleration in the size of the TCP window for efficient data transfer. TCP “selective ACKs” via RFC 2018 reduce the need to retransmit redundant data.

**Data Caching.** Citrix NetScaler includes AppCache™ which caches *both* static and dynamic content. Data is delivered to the requester directly as opposed to being redundantly requested from the appropriate server. Caching policies can be set to use either header or payload content for further granularity. Reducing content generation

provides performance gains to the user. Citrix AppExpert Visual Policy Builder provides a straight-forward way to configure caching policies and ensure fresh content of cacheable material.

### **Expanded Scalability of E-Business Servers**

Networking protocols, security requirements, and content caching represent just several processor intensive operations whose effects on servers can be minimized with offload mechanisms. If no such steps are taken, application performance may be impacted and E-Business users will suffer from lower performance. Citrix NetScaler with its full proxy architecture can largely offload these functions from servers and improve application performance and reduce operational expenses. Unlike some alternative products, Citrix NetScaler suffers no performance degradation as it is inherently designed for this capability.

**Server Back-end TCP Optimization.** The Citrix NetScaler design separates client and server TCP session processing. Through this full proxy technique, Citrix NetScaler can multiplex a large number of client side connections into a small number of back-end server connections that are “long-lived” sessions, offloading most of the laborious session set-up/tear-downs associated with TCP/IP. On the client side, over five million simultaneous connections can be maintained, enabling the most extensive E-Business deployment in “carrier-class” enterprises.

**SSL Server Offload.** Many attributes of E-Business require secure communication. Citrix NetScaler provides the SSL offload via hardware-based acceleration. The result is a substantial improvement in application performance with reduced server loading and rapid establishment of new SSL connections. With support for over 3000Mbps of encrypted SSL even the most intensive E-Business usage is not a problem.

**Server Caching Offload.** Content caching via Citrix AppCache™ represents another method to offload web servers. For frequently requested data, this offload removes a major burden and allows the server to service more requests. Infrastructure scalability is dramatically enhanced and server farms expansion demands minimized. While alternative solutions may offer only static caching, Citrix NetScaler handles dynamic content with Citrix AppCache to greatly expand the potentially cacheable information. With payload level inspection, caching policies can be based on HTTP body content.

### **Enhancing Enterprise Security**

**Application Layer Protection.** Network level firewall protection is common place today. Unfortunately attacks against Layer 7 functions are often not addressed. Such attacks target the application itself through methods such as cross-site scripting, cookie tampering, SQL injection and user-input field overflows. Even with the most optimized code, hackers find ways to wreak havoc. Citrix NetScaler has integrated web application firewall protection against these and many other techniques.

**Content Filtering Based Security.** Denial of service attacks, that are increasingly occurring all the way to Layer 7 are further mitigated by content filtering and dropping invalid requests. Data leakage of business suite data often through inadvertent distribution of information outside the corporate perimeter can be prevented. Worms and other malicious assaults can be identified and dropped in real-time with further content inspection.

### **Web Application Performance Visibility**

The best network infrastructure and application server deployments occasionally have performance limitations which can hamper the user experience. Obtaining the root cause can be challenging and lead to disagreement, even among the most harmonious of networking and application groups. Citrix NetScaler provides an invaluable tool, Citrix EdgeSight™ for NetScaler, which provides transaction-level visibility of web application performance. Enterprises now can track and report on performance over time and compare current with historical trends. Measurable parameters include time-to-initial page load, time for server infrastructure to process a request, and switching times. These enable planning intelligent capacity optimization. Proactive monitoring provides help in identifying the source of performance limitations before they result in user frustration. This visibility does not hamper E-Business users in any way as no client agent is needed; Citrix NetScaler does all the heavy lifting with nominal IT management configuration.



**About Citrix NetScaler:** Citrix Systems Inc. is the global leader and the most trusted name in Application Delivery Infrastructure. Citrix NetScaler optimizes the delivery of web applications—improving performance up to 5x, increasing security, and potentially doubling web server capacity at half the cost—ensuring the best total cost of ownership (TCO), security, availability, and performance for web applications. Citrix NetScaler combines high-speed load balancing and content switching with state-of-the-art application acceleration, layer 4-7 traffic management, data compression, static and dynamic content caching, SSL acceleration, network optimizations, and robust application security into a single, tightly integrated solution. Citrix NetScaler significantly reduces processing overhead on application and database servers, reducing hardware and bandwidth costs.

**About Oracle:** Oracle (NASDAQ: ORCL) is the world's largest enterprise software company. For more information about Oracle, visit our Web site at <http://www.oracle.com>.

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