



Cisco Application Networking for Oracle E-Business Suite

High Availability and Security for Global Deployments, and Optimized Response Times and Bandwidth Utilization for Branch Users

HIGHLIGHTS

Business Benefits

- High Availability
- Optimize Performance
- Minimize Risk
- Reduce Total Cost of Ownership

Why Cisco?

- Complete integrated network architecture: Application and Ethernet switching, security, WAN optimization, and network management
- Market-leading products: Cisco® ACE Application Control Engine, Wide Area Application Services (WAAS) Software, Catalyst® 6500 Series Switches, and Catalyst 6500 Series Firewall Service Module (FWSM)
- Global lifecycle services leader: Certified by J.D. Power & Associates Certified Technology Service & Support Program

Overview

To address challenges associated with today's mission-critical enterprise application deployments, Cisco, in collaboration with Oracle, offers Cisco Application Networking for Oracle E-Business Suite, an enterprise network architecture, with best practices and implementation guidance that optimizes application availability, performance, and security and lowers application ownership costs (Figure 1).

This overview describes how the solution addresses the following business challenges for Oracle E-Business Suite 11i and 12i deployments serving global users across challenging WAN links by using data center and WAN application optimization services from Cisco ACE Application Control Engine, Catalyst 6500 Series Firewall Service Module (FWSM), Wide Area Application Services (WAAS) Software products, and Catalyst 6500 Series Switches:

- Enterprise-class high availability for mission-critical applications
- Fast application response time over limited WAN connections
- Secure application, server, network, and service-oriented architecture (SOA)
- Reduced capital and operational costs for applications, servers, and networking

Tests of this solution showed up to two times faster site navigation and 90 percent reduction in bandwidth use for Oracle E-Business Suite deployments over the WAN when paired with Cisco application networking solutions for specific deployment scenarios. Additional solution benefits

include increased application security and availability and reduced server processing.

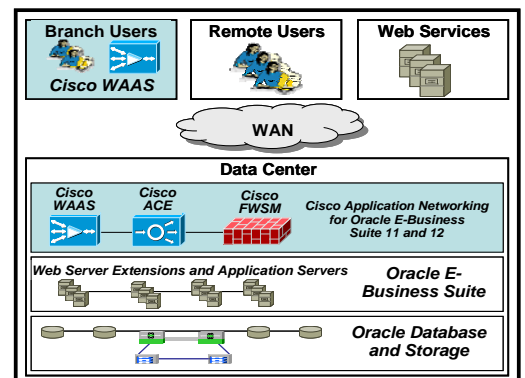
Business Challenge

In today's globally networked economy, where enterprise application availability, performance, and security are tightly linked to customer success and profits, application stakeholders are faced with new challenges.

As applications expand to handle new business processes and serve more geographically and organizationally dispersed user populations, service levels and costs are increasingly scrutinized. Further, increased complexity and stifled innovation can affect productivity and disappoint primary constituents.

To achieve expected service levels and costs in this demanding environment, enterprise application deployments are converging and are more likely to run in one location isolated from a second, standby site; serve global users through web browsers and standard Internet protocols; and use a SOA platform.

Figure 1 Cisco Application Networking for Oracle E-Business Suite 11 and 12



This new business environment and application architecture intensifies four major IT challenges. Each can be addressed by a strong enterprise network architecture using Cisco Application Networking for Oracle E-Business Suite:

- Application availability challenges: Increasing business dependence on fewer but larger applications deployed in a central location requires a more careful examination of application architecture, including single points of failure and product stability, to achieve both recovery time and recovery point objectives.
- Application performance challenges: Limited WAN links and inefficient Internet standard protocols such as HTTP and Extensible Markup Language (XML) result in poor application performance and bandwidth utilization for global users. Further, increased demand on large applications in centralized data centers results in overload on servers that slows application response time.
- Application security challenges: Business risk due to application security breaches from malicious or innocent end users or SOA web service requests that attack application, server, or operating system vulnerabilities continues to increase.
- Application ownership cost challenges: The increasing scope of application business logic and geographically and organizationally dispersed users, coupled with higher availability, performance, and security needs, requires a

new approach to application support to keep costs in line with diminishing budgets.

Given these significant challenges, it is increasingly important to turn to application-savvy infrastructure vendors—such as Cisco—with solutions that cost-effectively address today's business-level application and IT challenges and a commitment to rigorous feature and system quality testing, global and local-language support 24 hours a day, and a strong history of security expertise.

Equally important is an application infrastructure vendor that partners with leading application vendors—such as Oracle—to yield tested, documented, and validated joint architectures that optimize application availability, performance, and security and lower application ownership costs.

Business Benefits

Cisco Application Networking for Oracle E-Business Suite offers optimized application availability, performance, security, and costs through four application optimization services:

- Oracle E-Business Suite application availability: Cisco ACE product family application optimization services for high availability:
 - Cross-data center load balancing: Efficiently routes end-user and web services requests to the best available data center
 - Application health monitoring: Continuously and intelligently monitors application and database availability
 - Server load balancing: Efficiently routes end-user and web services requests to the best available server
 - Network platform health monitoring: Helps ensure continuity of business operations through mirroring end user transaction states across pairs of network devices
- Oracle E-Business Suite application performance: Cisco ACE and WAAS application optimization services for high performance:
 - WAN optimization: Provides intelligent caching, compression, and protocol optimization that yields up to two times faster site navigation and 90 percent reduction in bandwidth use
 - Server offloading: Provides specialized hardware that offers greater processing efficiency for the application optimization services, freeing up to 50 percent of application server processing and memory to focus on business logic computations (based on independent tests run by Cisco)

Table 1 Services Offloaded from Servers by the Solution

Service	Description
Cross-data center load balancing	Helps ensure high availability
Server load balancing	Provides advanced load balancing algorithms for optimized server utilization
Secure Sockets Layer (SSL) termination	Terminates 15,000 connections per second
TCP connection management	Significantly reduces TCP overhead in the server
Application health monitoring	Improves availability of the server farm
Traffic compression	Provides scalable GNU zip function and reduces bandwidth use
Object caching	Reduces the number of requests to the server
XML schema validation	Performs 30,000 schema validations per second and improves security

- Oracle E-Business Suite application security: Cisco ACE application optimization services for optimized data security:
 - SSL termination (also known as SSL acceleration): Efficiently encrypts and decrypts SSL-enabled traffic, facilitating the use of intrusion detection and prevention solutions before traffic reaches the servers, reducing server CPU use, and centralizing certificate management
 - End-user access control: Provides access control lists (ACLs) to protect client-to-server traffic from worms and intruders that attack vulnerable open server ports not used by the application
- Oracle E-Business Suite application ownership cost: Cisco Application Networking for Oracle E-Business Suite reduces application capital and operational costs:
 - Server cost reduction: Offloading of the application optimization services listed in Table 1 from servers to cost-effective network devices frees up to 50 percent of server processing and memory to focus on business logic computation.
 - Networking cost reduction: Virtualized application optimization services can be applied to multiple Oracle applications, including E-Business Suite, Siebel, PeopleSoft, and Fusion Portal applications, as well as other enterprise applications (Figure 2).
- Operating cost reduction: Application optimization services reduce operating costs as shown in Table 2.

Table 2 Operating Cost Reduction from Application Optimization Services

Cost Reduction	Description
WAN bandwidth use	Up to 90% bandwidth cost savings
Server power, cooling, space, and administration	Up to 50% operational cost savings
Application deployment administration	Virtualization of application services

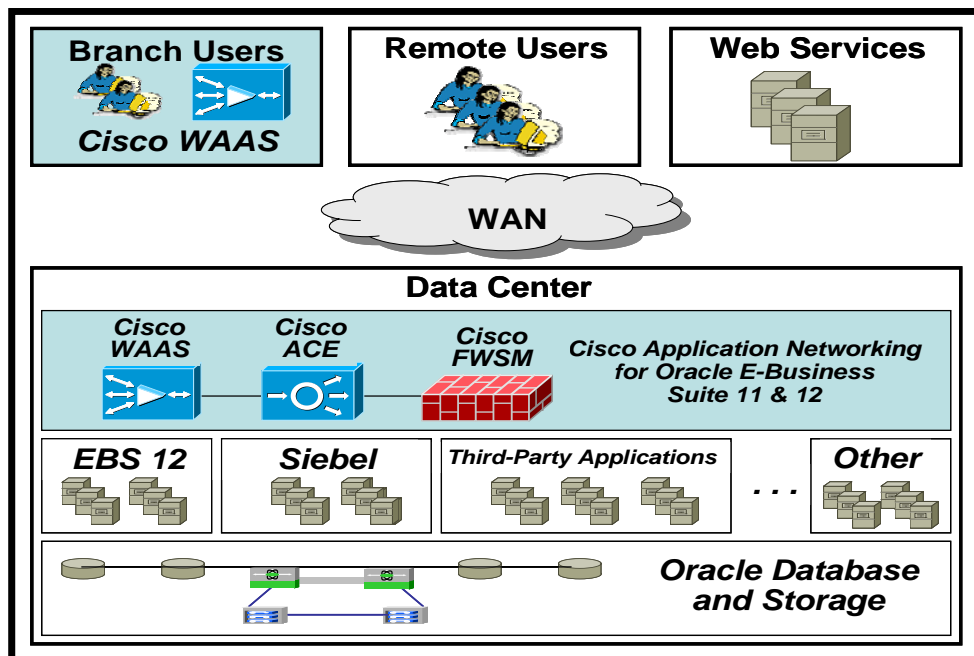
Solutions

Cisco Application Networking for Oracle E-Business Suite combines the Cisco ACE and WAAS platforms with the Oracle E-Business Suite architecture to provide optimized availability, performance, security, and cost of ownership, while complementing the existing similar features of Oracle E-Business Suite.

Oracle E-Business Suite with Cisco ACE and FWSM

The Oracle E-Business Suite architecture provides horizontal scalability by enabling addition of Oracle E-Business Suite application and web server instances as needed, which in turn creates the need for load balancing (Figure 3). Cisco ACE offers higher performance and availability through

Figure 2 Virtualization of Application Optimization Services



server load balancing, SSL termination, server health monitoring, and TCP connection management. Cisco FWSM adds advanced access control security.

Virtualization within the Cisco ACE 4710 appliance or the Cisco ACE and Firewall Services Modules for the Catalyst 6500 Series Switches allows a single active-active pair of Cisco ACE and FWSM products to serve multiple Oracle applications such as E-Business Suite, Siebel, PeopleSoft, and Portal applications, as well as other enterprise applications. Further, if Cisco ACE and FWSM are already deployed in the data center, additional virtualized contexts can be added to accommodate new Oracle applications without the need to order and configure additional equipment.

Additionally, Cisco ACE virtualized contexts can be created using Cisco ACE role-based access control (RBAC), which constrains the commands and actions for each context for unique application, database, security, and systems management administrators. Cisco ACE comes prepackaged with a number of predefined roles, and others can be customized as needed.

Oracle E-Business Suite with Cisco WAAS

Completing any Oracle E-Business Suite solution business transaction involves numerous components of the application architecture, including the client, web server, Oracle E-Business Suite Application servers, Oracle database servers, storage, and networking.

Each transaction typically requires several operations that, when requested by a remote user, travel over the WAN and can introduce network

delay that slows end-user performance. When network delay is significant due to constrained or overburdened bandwidth, distance of users to servers, or high numbers of operations needed to complete a transaction, end-user performance and bandwidth utilization improvements can be achieved through optimizations provided by Cisco WAAS, such as data redundancy elimination (DRE), TCP flow optimization (TFO), and persistent LZ compression.

When Cisco WAAS is deployed with Oracle E-Business Suite, tests show significant round-trip time and bandwidth reduction, as discussed in the "Testing" section later in this document.

Solution Deployment

Cisco ACE, FWSM, and WAAS reside in the data center and are arranged to provide application optimization services for multiple Oracle application deployments as well as other enterprise applications.

Because of their unique location, these solutions can take intelligent action on end-user traffic before it is routed to the Oracle E-Business Suite application servers, including load balancing, server health monitoring, SSL decryption, TCP connection management, and security access control (Figure 4). Cisco Application Networking for Oracle E-Business Suite provides these services cost effectively, freeing up to 50 percent of server processing and memory.

Cisco WAAS also resides in the branch office and is arranged to provide virtualized application optimization services for all application users in

Figure 3 Cisco Application Networking for Oracle E-Business Suite

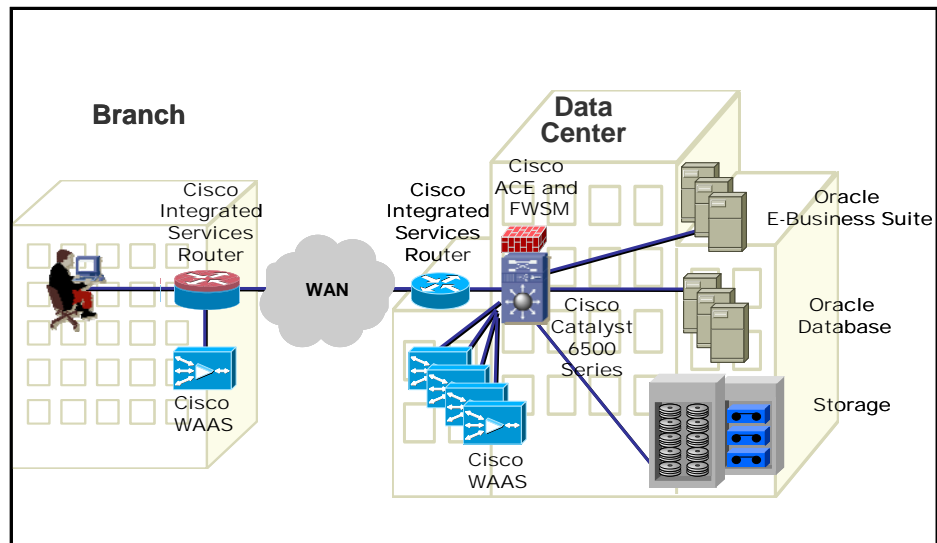


Figure 4 Data Center Application Optimization Services

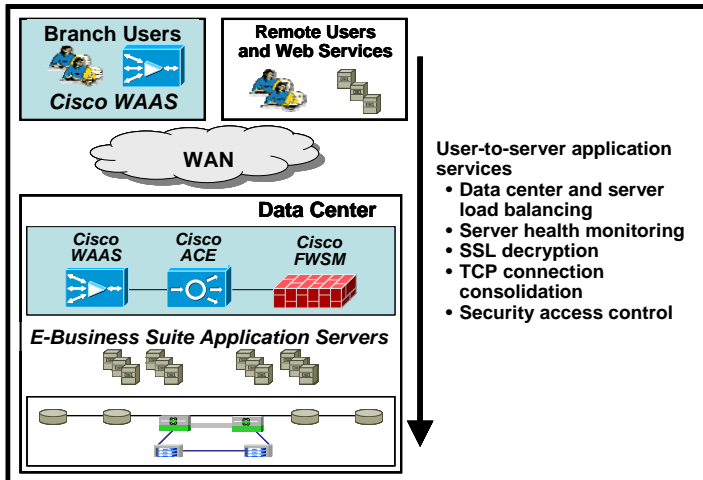
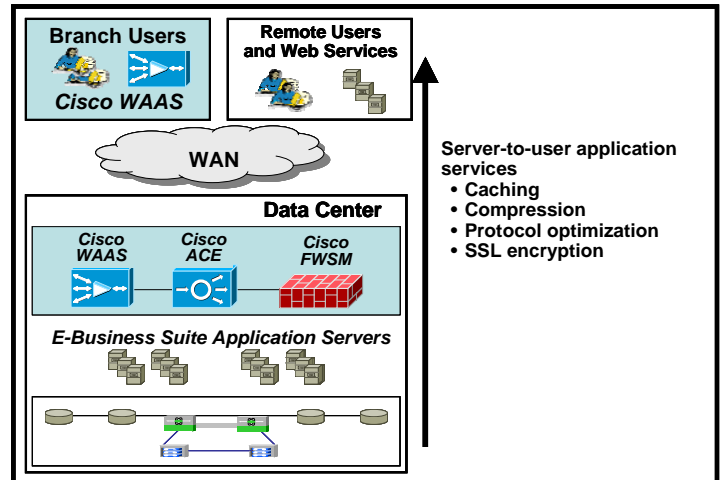


Figure 5 WAN Application Optimization Services



that location. The Cisco WAAS data center and branch-office deployments together offer a WAN optimization service through the use of intelligent caching, compression, and protocol optimization.

When the Oracle E-Business Suite application servers respond to end-user requests, the response is efficiently passed across the WAN, with low bandwidth use and high throughput. Commonly accessed information is cached both at the Cisco WAAS solution in the branch office and in the Cisco ACE solution in the data center, significantly reducing the burden on the servers and the WAN (Figure 5).

Recommended best practices and implementation guidance for Cisco Application Networking for Oracle E-Business Suite, including specific configurations for each Cisco network solution, can be found in the two separate Cisco Application Networking for Oracle E-Business Suite 11*i* and 12 deployment guides at Cisco.com.

The Cisco ACE and FWSM solutions can be deployed in the data center as a module in the Cisco Catalyst 6500 Series Switches or as an appliance. The Cisco WAAS solution can also be deployed in a branch office as a module in a Cisco Integrated Services Router or as an appliance.

Testing

Cisco, in collaboration with the E-Business Suite product team at Oracle, conducted a series of function, load, and performance tests, which resulted in the Cisco Application Networking for Oracle E-Business Suite architecture, best

practices, and implementation guidance.

Cisco WAAS Performance Testing

The Cisco WAN optimization solution for Oracle applications was tested at Cisco labs in North Carolina by Cisco engineers with the help of Oracle personnel. These tests were set up to closely represent real customer deployments.

For this testing, Oracle E-Business Suite 11*i* Version 11.5.10.2 was deployed with Hewlett-Packard (HP) servers housing Intel processors and Linux operating system, EMC storage, and Cisco networking equipment. The Mercury LoadRunner testing suite was used to simulate end users conducting transactions with the Oracle E-Business Suite application. One set of tests was conducted over a 5-minute period in which 20 users repeatedly performed a number of steps that represented single end-user transactions: accessing employee pay slips in one case and ordering an item in another. These tests were run both with and without the Cisco WAAS solution, and average time, total number of transactions, and bandwidth utilization were measured.

A second set of tests were conducted in which 100 users, divided into 10 groups, repeatedly performed a number of steps that represented a single transaction for each group in which a predetermined number of transactions were completed. These tests were run both with and without the Cisco WAAS solution, and total time to conduct such transactions was measured.

For More Information

- Cisco product and solution literature
 - Cisco.com/go/applicationservices
 - Cisco.com/go/optimizemyapp
 - Cisco.com/go/ace
 - Cisco.com/go/waas
 - Cisco.com/go/fwsm
- Oracle product literature
 - oracle.com/applications/e-business-suite.html
- Cisco and Oracle partnership
 - Cisco.com/go/oracle
 - Oracle.com/goto/cisco

To contact a Cisco salesperson or to obtain additional information, please email solutionsfororacle@external.cisco.com.

All simulated end users accessed the Oracle applications through a web browser, and some transactions required access to the application server through the forms listener servlet. The web browser cache was cleared before the tests ran but not during the tests. The servers and storage devices never reached maximum capacity and therefore did not affect the test results.

The tests were conducted for a number of remote-office scenarios set up to represent typical intercontinental and intracontinental WAN links by inserting transaction delay times of between 50 and 400 milliseconds (ms). The bandwidth was fixed at a maximum rate of 1.544 Mbps, and the WAN traffic was not Secure Shell (SSL) enabled.

Figure 6 shows that the Oracle E-Business Suite pay slip transaction performed 72 percent faster with Cisco WAAS than without it.

Figure 7 shows that the Oracle E-Business Suite i-procurement transaction required 90 percent less bandwidth with Cisco WAAS than without it.

Statement of Cooperation

Cisco and Oracle cooperated in all phases of this joint project, including lab setup, solution testing, and solution overview and deployment guide documentation. Cisco and Oracle jointly validate that the lab setup and solution testing represents best efforts to create a realistic customer deployment and accurate documentation of this deployment.

Figure 6: Oracle E-Business Suite Pay Slip Average Transaction Time

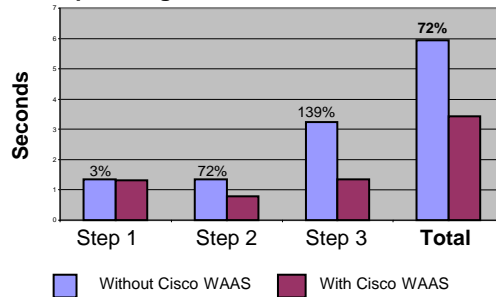
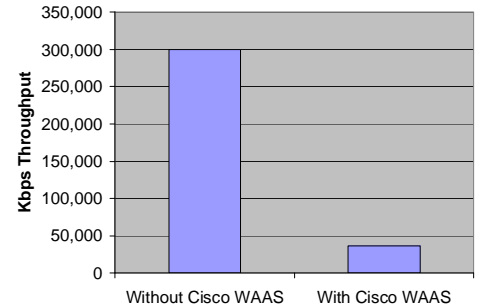


Figure 7: Oracle E-Business Suite i-Procurement Bandwidth Reduction



Copyright 2008 Oracle and Cisco All Rights Reserved.

This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor is it subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.