



Transforming Application Performance with Cisco Application Control Engine



Ong Poh Seng

ongps@cisco.com

31st Oct 2008

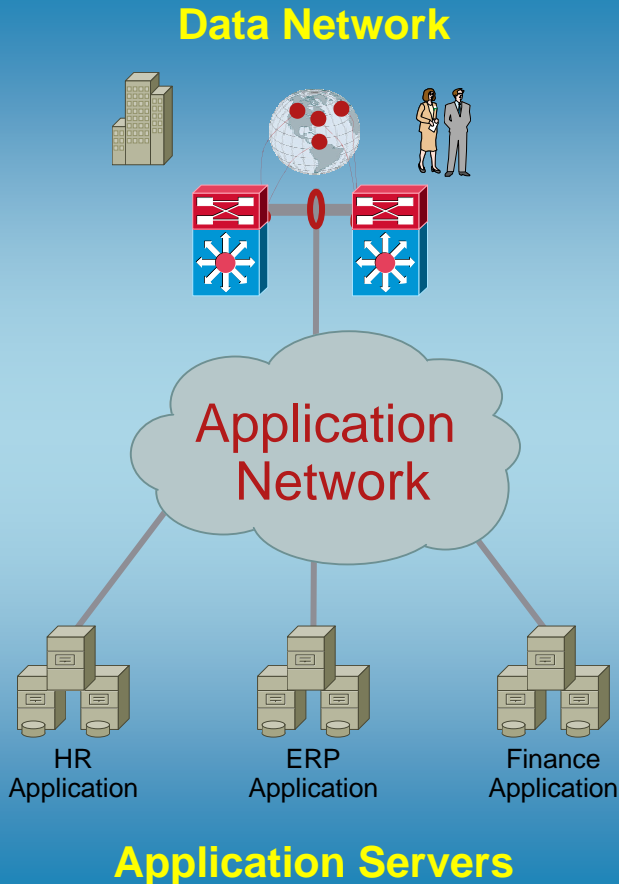
Agenda



- Application Challenges and Solution
- ACE Product Highlight
- Features and Benefits
- DCAP
- Global Server Load Balancing
- Summary
- Q&A



Today's Application Challenges— Delivering Applications



Performance

- Explosion in users, applications, WAN and recreational traffic—latency and bandwidth
- Device sprawl—power/cooling out of control

Operational Expenses

- Slow time to deployment
- Underutilized physical resources
- Too many products and vendors

Security

- Security threats come from L2-L7
- New attack types focusing on applications and payloads
- Day zero attacks and custom apps—no signatures available

Application-to-Application Communication

- Service-Oriented Architectures (SOA) and Web 2.0—security vulnerabilities and performance bottlenecks

Application Networks Must Take The Next Step to Address Today's Application Challenges: Load Balancing and Much, Much More ...

Application Optimization Infrastructure

Network Classification

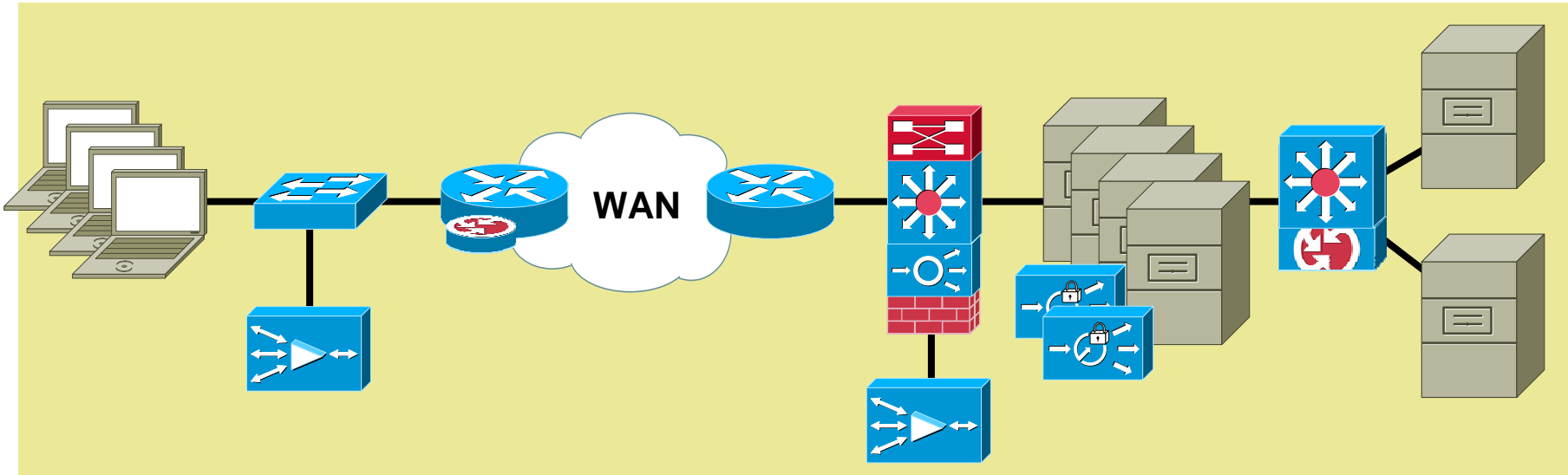
- Quality of service
- Network-based app recognition
- Queuing, policing, shaping
- Visibility, monitoring, control

Application Scalability

- Server load-balancing
- Site selection
- SSL termination and offload
- Video delivery

Application Networking

- Message transformation
- Protocol transformation
- Message-based security
- Application visibility



Application Acceleration

- Latency mitigation
- Application data cache
- Meta data cache
- Local services

WAN Acceleration

- Data redundancy elimination
- Window scaling
- LZ compression
- Adaptive congestion avoidance

Application Optimization

- Delta encoding
- FlashForward optimization
- Application security
- Server offload

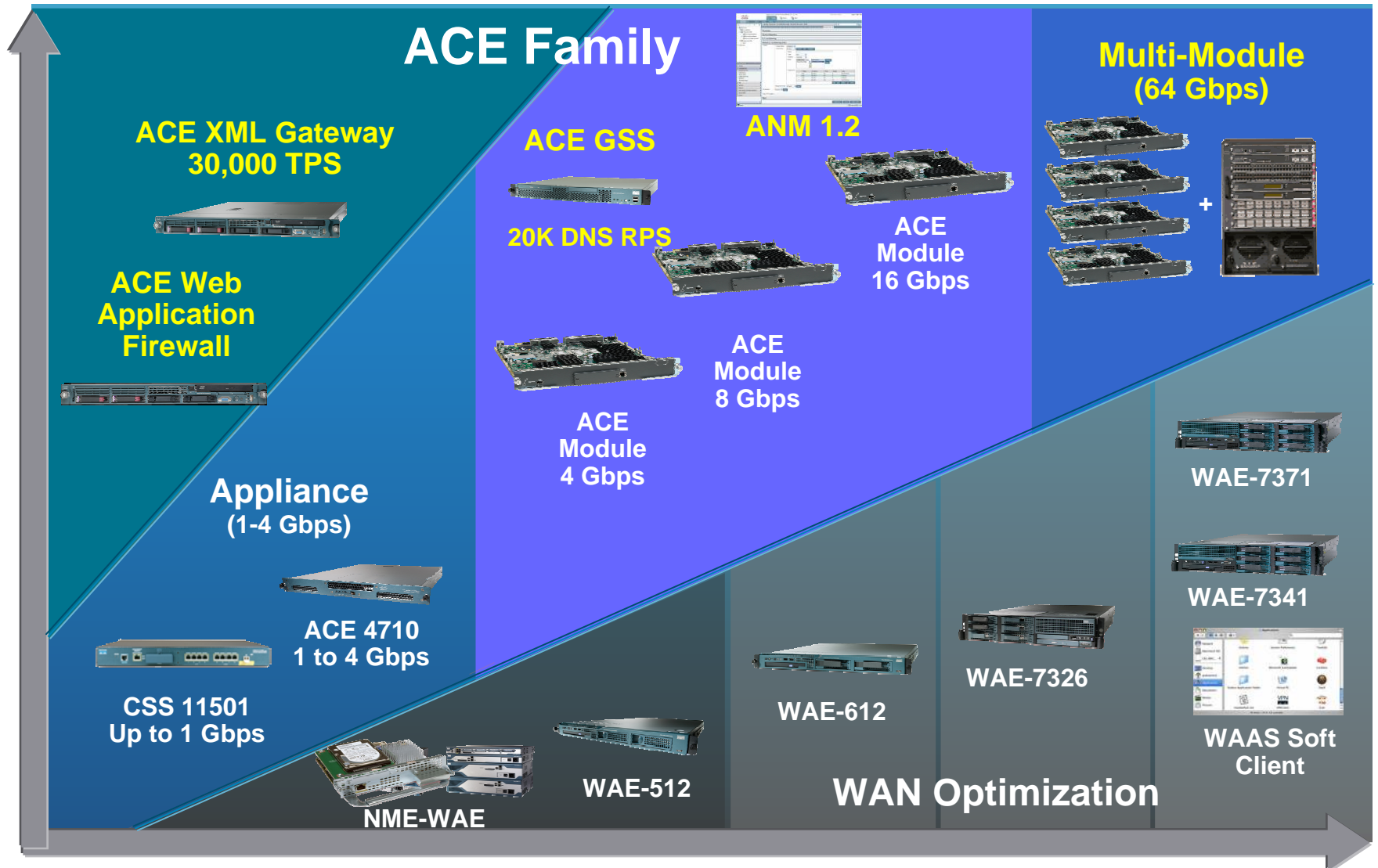
Agenda



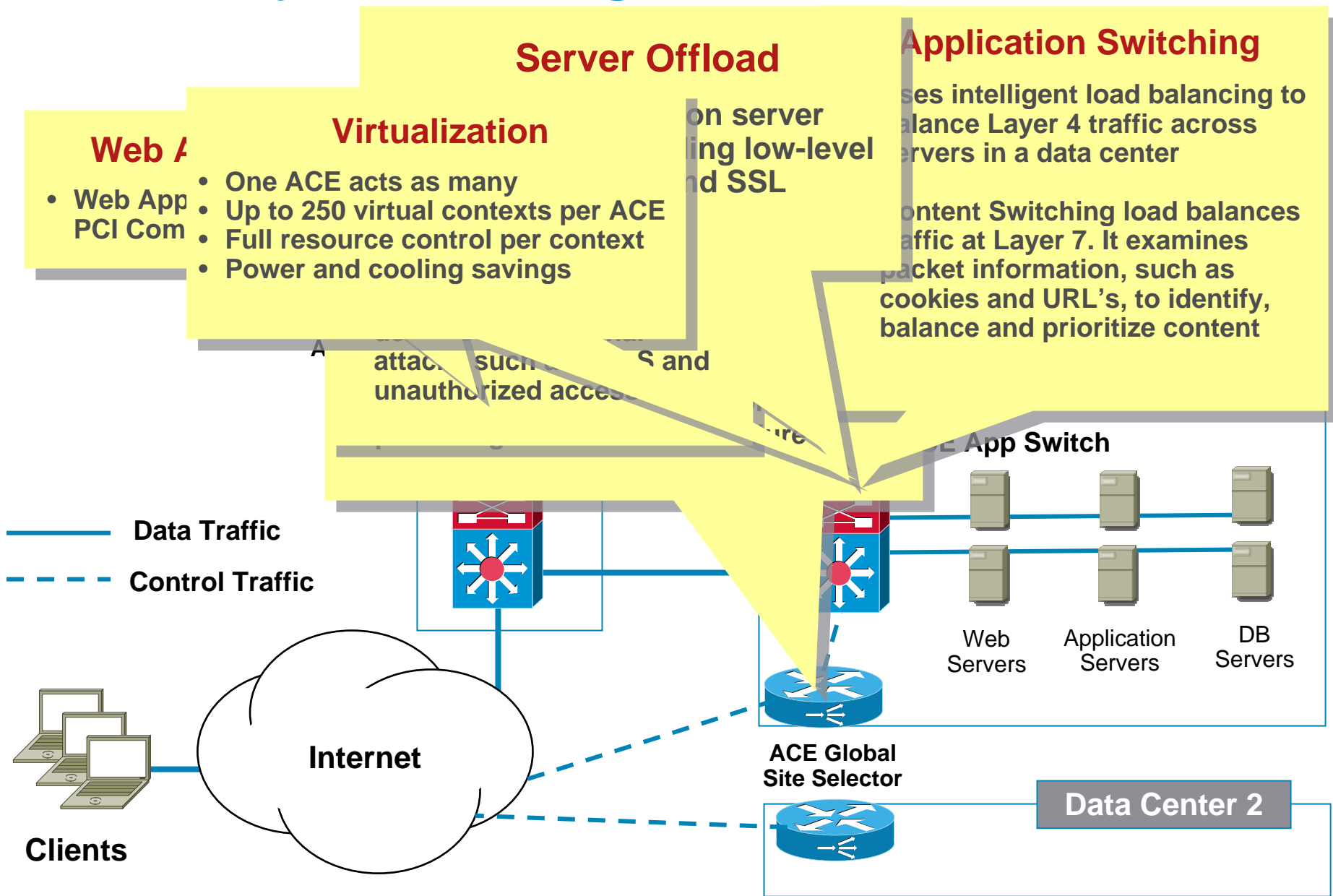
- Application Challenges and Solution
- **ACE Product Highlight**
- Features and Benefits
- DCAP
- Global Server Load Balancing
- Summary
- Q&A



Application Networking: ACE Family Extends A Winning Portfolio

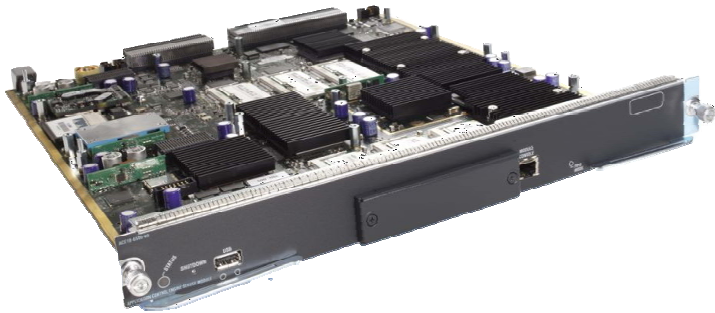


ACE Key Technologies



Product Overview - ACE Module

Fast, Available, and Secure



Integrates load balancing, application optimization & security

Industry's highest performance: 4 – 64 Gbps

Only guaranteed application resources and availability

Most scalable security for data center applications

Only product with forklift-free upgrades

NEBS Certified

Module for Catalyst 6500 Switch & 7600 Router

**Industry's Only Virtualized Architecture -
Faster App Rollouts, Green**

Product Overview - ACE 4710 Appliance

App Availability: Virtualization Increases Application Resiliency, Roles-Based Control Minimizes Workload

App Performance: Patented Asymmetric Acceleration + Real-World Architecture

IT Agility: Software-Based Upgrades, Faster App Roll-Outs through Virtual Devices

Lower TCO: Less Power via Virtual Devices, Significantly Less CapEx



Industry's Best Price/Performance

Unmatched License-Based Scalability

Upgrade
Compression

Upgrade
Virtual Devices

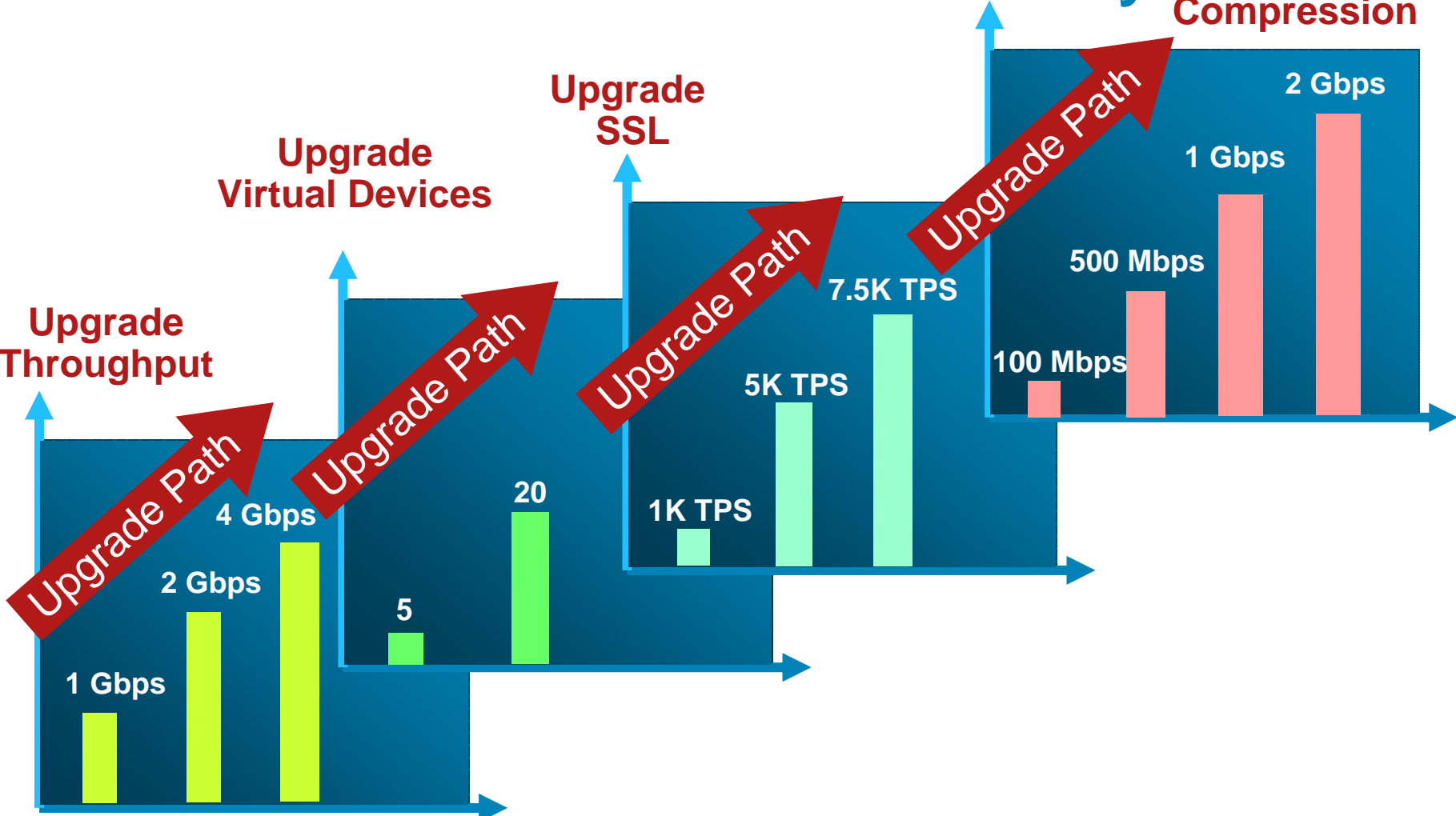
Upgrade
SSL

Upgrade Path

Upgrade Path

Upgrade Path

Upgrade
Throughput



Investment Protection and Pay-As-You-Grow

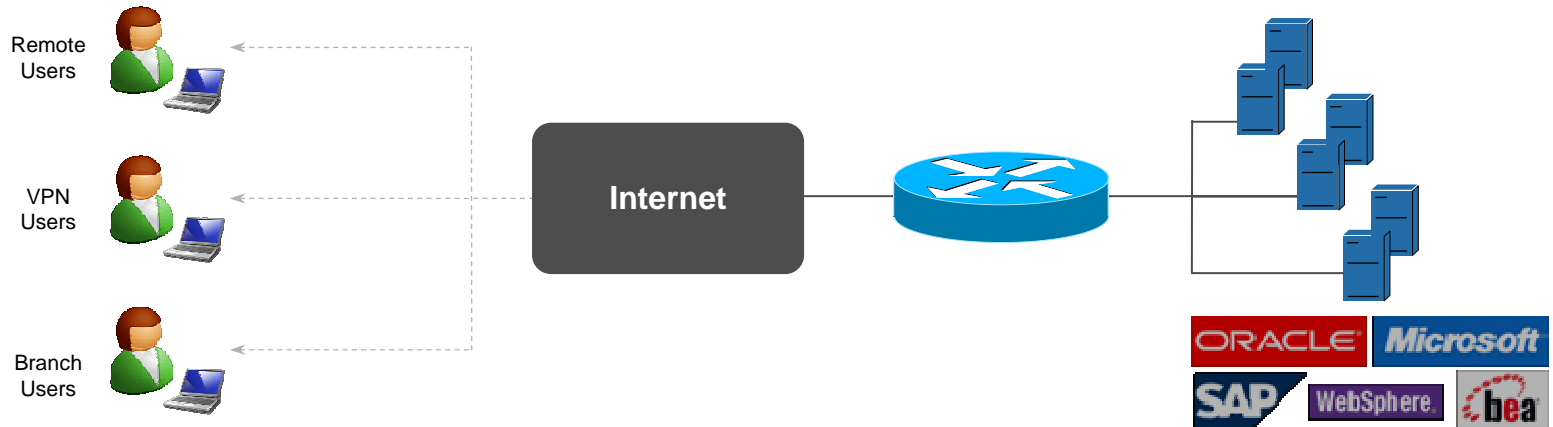
Agenda



- Application Challenges and Solution
- ACE Product Highlight
- **Features and Benefits**
- DCAP
- Global Server Load Balancing
- Summary
- Q&A



Customer Problem: Application Response Times Too Slow



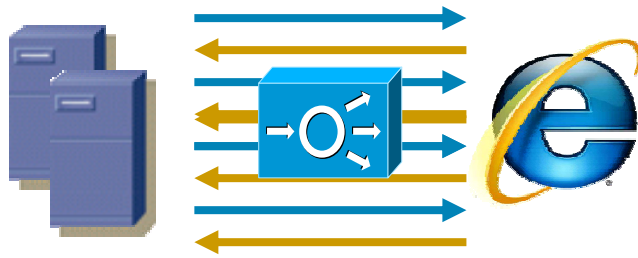
- High network latency
- Low bandwidth to remote users / offices
- Long back-end delays
- SSL processing overhead

Poor performance for web-based applications

Solution: ACE Application Acceleration

More Speed, Less Traffic

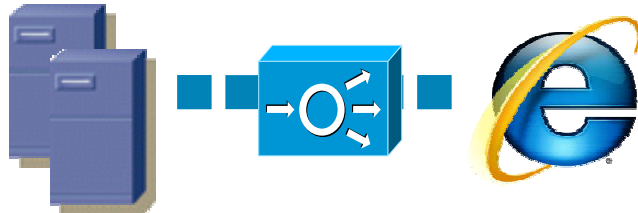
Latency Reduction



Minimal roundtrips

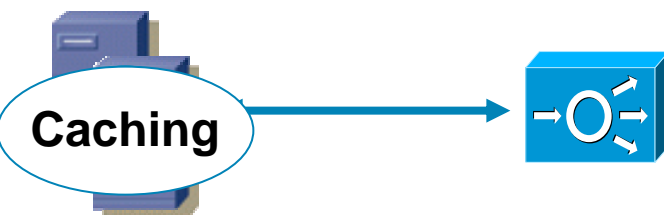
- Patented FlashForwarding for fewer roundtrips for faster page downloads
- Efficient connections management

Bandwidth Reduction



- Patented Delta Encoding sends changed data only, reducing number of bytes transmitted
- Compression for all data types

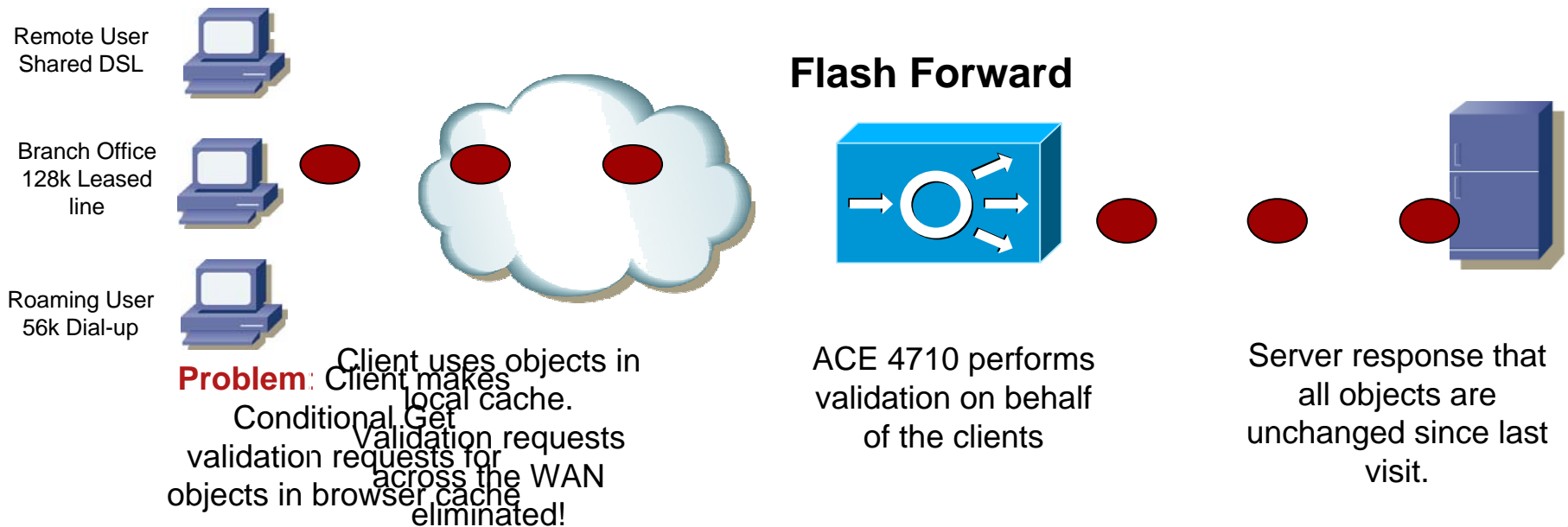
Required data only Server Offload



- Increase server capacity by offloading:
 - SSL termination
 - TCP connection management
 - Static and Dynamic Caching

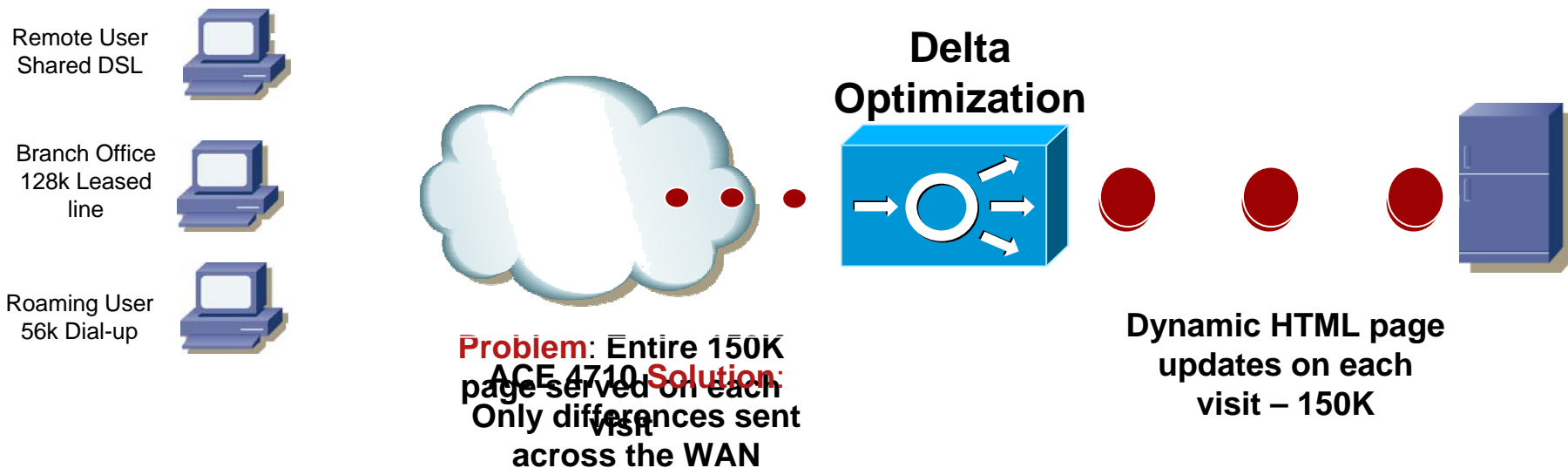
Cisco ACE 4710 Flash Forward

- Extends the ACE 4710 appliance's bandwidth usage reduction and download acceleration benefits to objects that are embedded within HTML pages.
- Eliminates the network delays associated with embedded web objects such as images, style sheets, and JavaScript files
- Guarantees clients request the most up-to-date content.
- Significantly accelerates page downloads and reduces both upstream and downstream traffic that is associated with object validation requests.



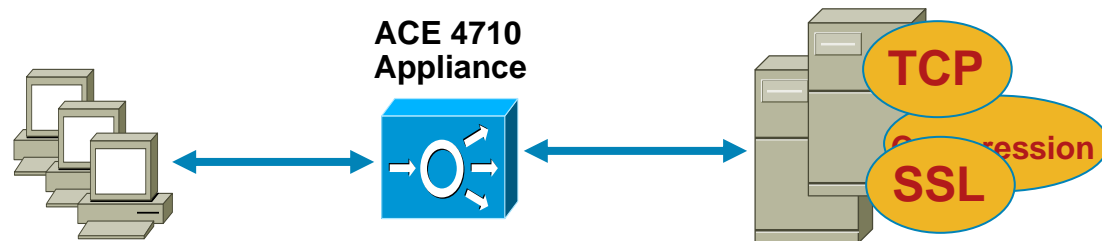
Cisco ACE 4710 Delta Optimization

- ACE delta optimization applied to dynamic web applications such as .Net J2EE SAP Oracle Siebel Lotus
- Enables dynamic update of client browser caches with content differences or deltas
- Observes and modifies HTML content that flows through it to achieve bandwidth savings and user download performance.
- Results in bandwidth savings and improved end-user experience



Cisco ACE 4710 Server Offload – More Efficient Servers

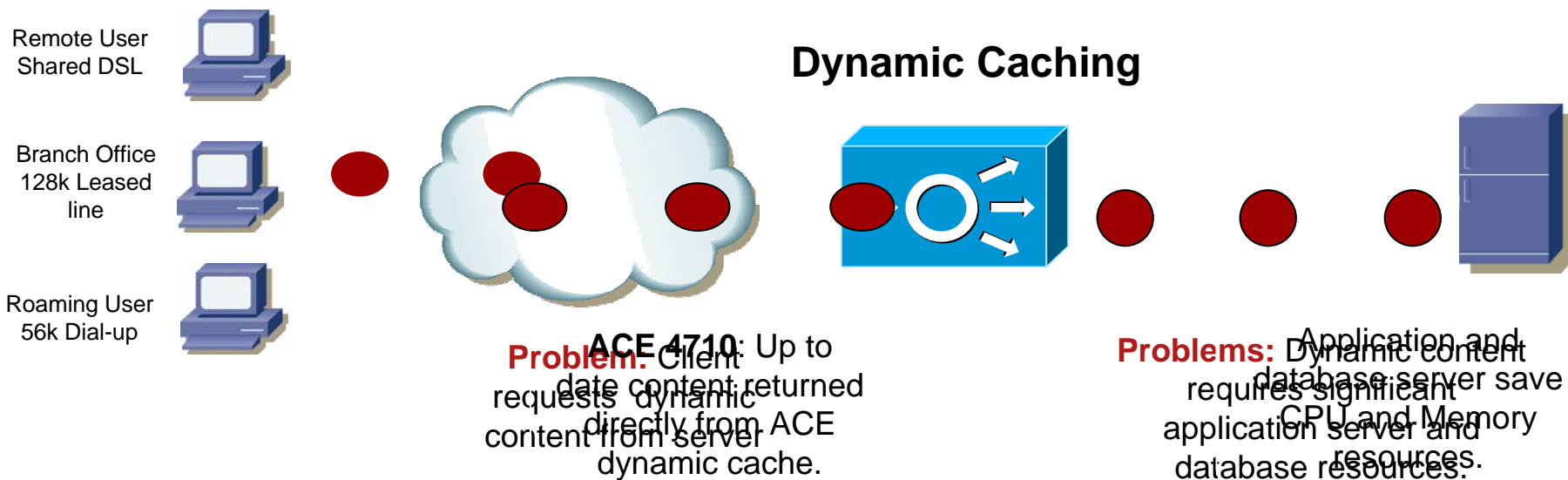
- **Challenges:** Server resource contention forces customers to deploy large number of web and application servers.
- **Solution:** Cisco ACE 4710 can offload many functions from servers and allow more efficient use of operating system resources for applications
 - **TCP Reuse:** Reduces number of established TCP connections to the server farm
 - **SSL Acceleration:** Offloads web server from SSL connection handling
 - **HTTP Compression:** Compresses web content on behalf of the web server
 - **Dynamic Caching:** Reduces application and database load by increasing cache TTL based on application server load



- **Benefits:**
 - Reduced size of application server farms
 - Improved application response for dynamic content for all users even at peak load

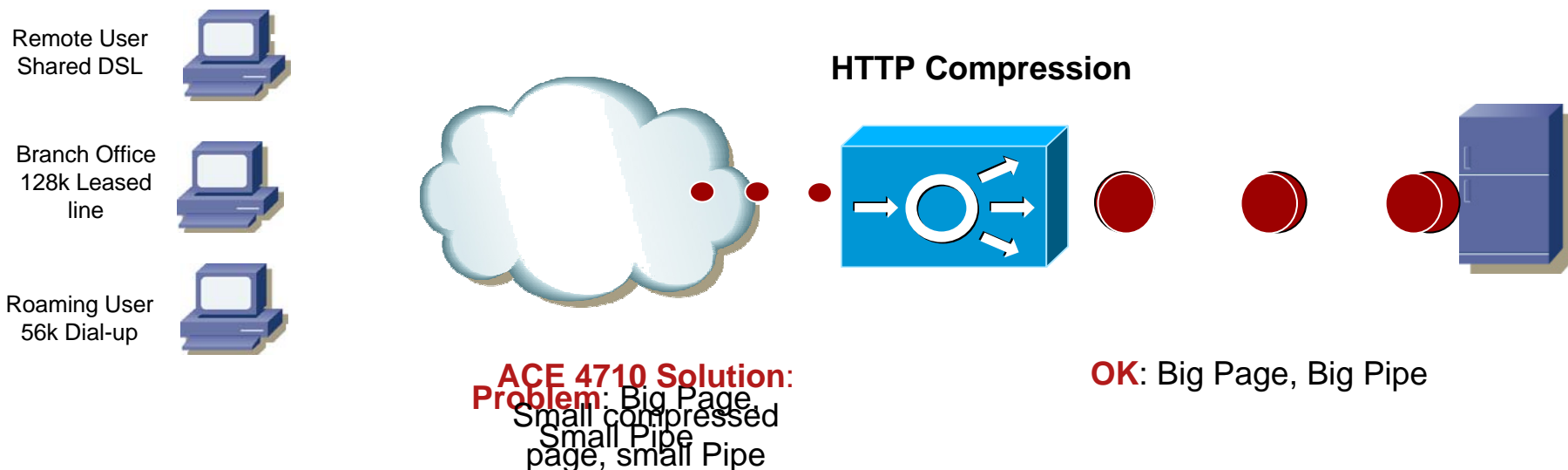
Cisco ACE 4710 Server Offload - Dynamic Caching

- Enables the Cisco ACE 4710 to fulfill requests for dynamic or personalized information
- Offloads application servers and databases
- Significantly improves application response time, reduces the server load, and enables more concurrent users to be served.
- Improved scalability and lower ongoing server upgrade costs.



Cisco ACE 4710 HTTP Compression

- Reduces HTTP traffic using GZIP and Deflate compression algorithms which are supported in today's Web browsers.
- Compression is completely transparent to the end user, requiring no downloads or agents.
- Up to 90% reduction in size of web objects such as static and dynamic HTML, Flash, PDFs, Text files, XML
- Optimizes delivery of content for last-mile bandwidth bottlenecks.
- Accelerates end-user experience.



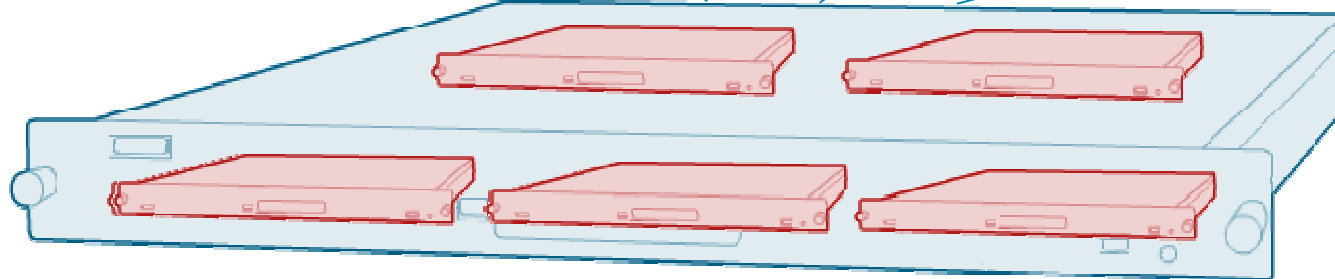
Virtualization For Faster Application Rollouts: From Weeks To Minutes

- **Deploy a virtual device, not a physical device**

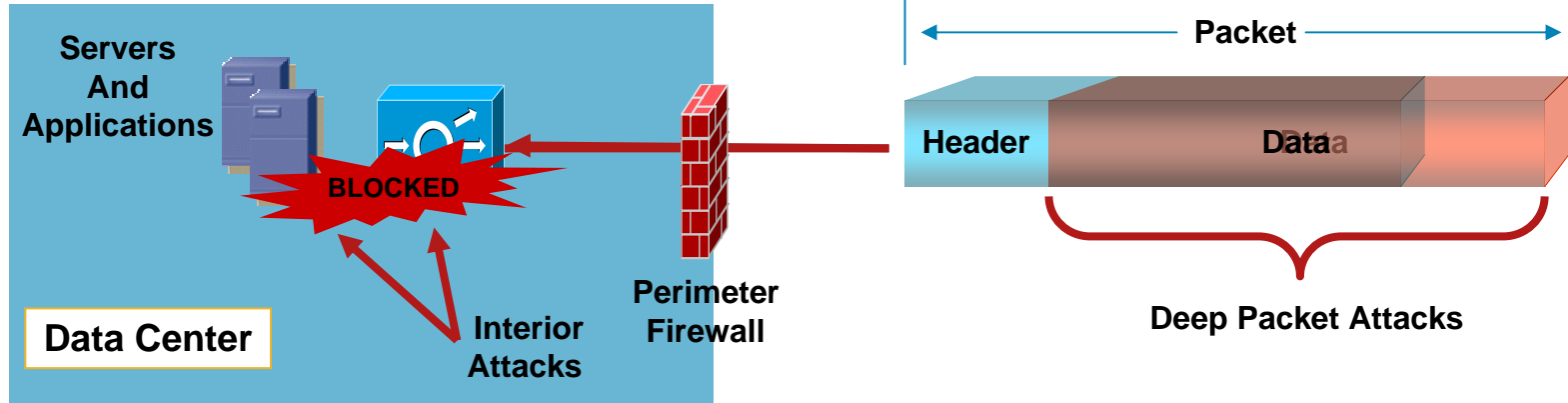
- Eliminates purchase cycle
- No device install or setup
- Partitions deployed in minutes
- Typical savings: two to four weeks

- **Role-Based Administration**

- Delegate customizable administrative rights to each IT department
- Eliminates coordination choke points and trouble tickets
- Typical savings: 6 to 8 trouble tickets and two to four days



Preventing Payload Attacks: The Last Line Of Server Defense



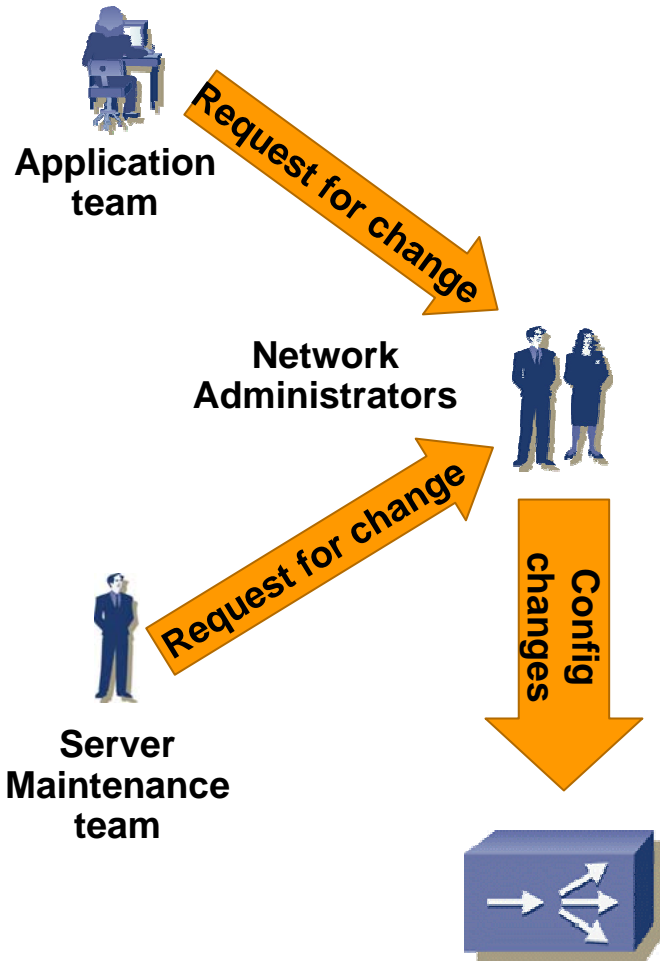
- Deep Packet Attacks

 - Firewall solutions without ACE can't adequately protect application data
 - ACE performs deep packet inspection and blocks app attacks
 - Generic Protocol Parsing extends this protection to any protocol

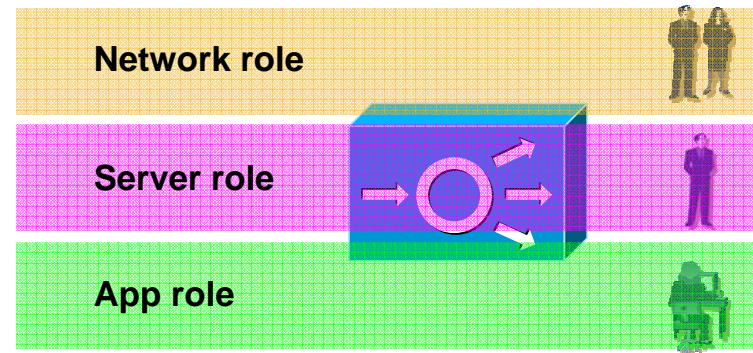
- Interior Attacks: Leverage ACE's position in front/between servers
Protects against DDOS, protocol attacks, and unauthorized access

ACE Role Based Administration (RBA)

Lack of delegated management



Improved workflow with Role Based Access Control



Customizable and Granular
Role Based Administration on ACE

Agenda



- Application Challenges and Solution
- ACE Product Highlight
- Features and Benefits
- **DCAP**
- Global Server Load Balancing
- Summary
- Q&A



Cisco Data Center Assurance Program

The screenshot displays a 3D perspective view of two data centers, Data Center A and Data Center B, connected via an IP WAN. The network is composed of various server and switch icons connected by lines. Several callout boxes highlight specific solution tests:

- Storage Switching SOLUTION TEST
- Microsoft Exchange SOLUTION TEST
- Blade Server Switches SOLUTION TEST
- Server Switching L2-L3 SOLUTION TEST
- Wide Area Application Services SOLUTION TEST
- Business Continuity CSS SOLUTION TEST
- Business Continuity SOLUTION TEST

A pop-up window titled "Microsoft Exchange Application Test" is open, providing details about the product and a link to a PDF report.

Microsoft Exchange Application Test
collaborative software product developed by Microsoft. It is part of the Microsoft Servers line of server products and is widely used by enterprises using Microsoft infrastructure solutions. Exchange's major features consist of electronic mail, calendaring, contacts and tasks, and support for the mobile and web-based access to information, as well as supporting data storage.

[MICROSOFT EXCHANGE 2003 TESTING AND RESULTS \(PDF\)](#)

Navigation tabs at the bottom include: Products, Solution Tests, Methodology, PDF.

Page information at the bottom right: DCAP 4.0 | Version 46 | 5.27.2008

Resources For New App Rollouts



CISCO FOR APPLICATIONS APPLICATION PARTNERS

Overview | App Part | Solutions | Products | News & Resources

Headline - up to 45 characters

Main text - up to 100 words

Developer Forum
Join the Discussion
Descriptive text here
Start a New Topic (Link to NetPro)

Cisco Data Center Solution for Oracle Applications

Optimize Data Center Performance and Minimize Deployment Risks of Oracle Enterprise Applications

HIGHLIGHTS

Business Drivers

- Business business drivers
- Aligns IT with business
- Adapts to varying budget and risk requirements
- Proven modernization approach

Just Modernization Business Insight

- Understand the business drivers
- Create a business-driven path to SOA
- Identify modernization options
- Determine the modernization roadmap
- Prepare the project approach and required project steps

Overview

The Cisco Data Center Solution for Oracle Applications, a Cisco and Oracle jointly tested solution, optimizes performance and minimizes risks of Oracle E-Business Suite and Fusion Middleware application deployments with application and theme switching and access control including the Cisco ACE, Application Control Engine Module, Cisco Catalyst 6500 Series Switches, and Cisco Gateway 6500 Series Firewall Services Module (FSM), all deployed at the front end of the data center, the solution maximizes availability, performance, and security while minimizing the cost of ownership of Oracle applications.

Part of the Cisco Solutions for Oracle Deployments (Figure 1) is a comprehensive network architecture to optimize Oracle deployments, this solution is complementary to the other Cisco WAN Optimization Solution for Oracle Applications. Optimizes Oracle application performance over the WAN to remote offices and includes Cisco Wide Area Application Services (WAAS) Software.

Cisco Data Center Solution for Oracle Databases. Optimizes Oracle database requirements and includes the Cisco MDS 9000 Series Multitier SAN Switches.

This comprehensive network architecture can also be applied to Siebel CRM, PeopleSoft, and JD Edwards deployments with similar benefits.

The Challenge

To meet a solution of business and IT challenges, the data center application infrastructure, at the server, storage, and network levels, must provide increased availability, performance, and security to mission-critical applications while reducing the cost of management.

Application and data center consolidation, in combination with increased user population and geographic spread, intensifies these challenges, as do growing power and cooling costs and insufficient server and storage utilization.

To address these challenges, Cisco and Oracle have learned to provide the Cisco Data Center Solution for Oracle Applications, a validated data center network architecture to optimize Oracle applications for availability, performance, security, and cost.

Figure 1. Cisco Architecture for Oracle Deployments

Powerful testing, design guides, ISV validation

<http://www.cisco.com/go/optimizemyapp>

Agenda



- Application Challenges and Solution
- ACE Product Highlight
- Features and Benefits
- ACE Performance
- DCAP
- **Global Server Load Balancing**
- Summary
- Q&A



Geographic Server Load Balancing

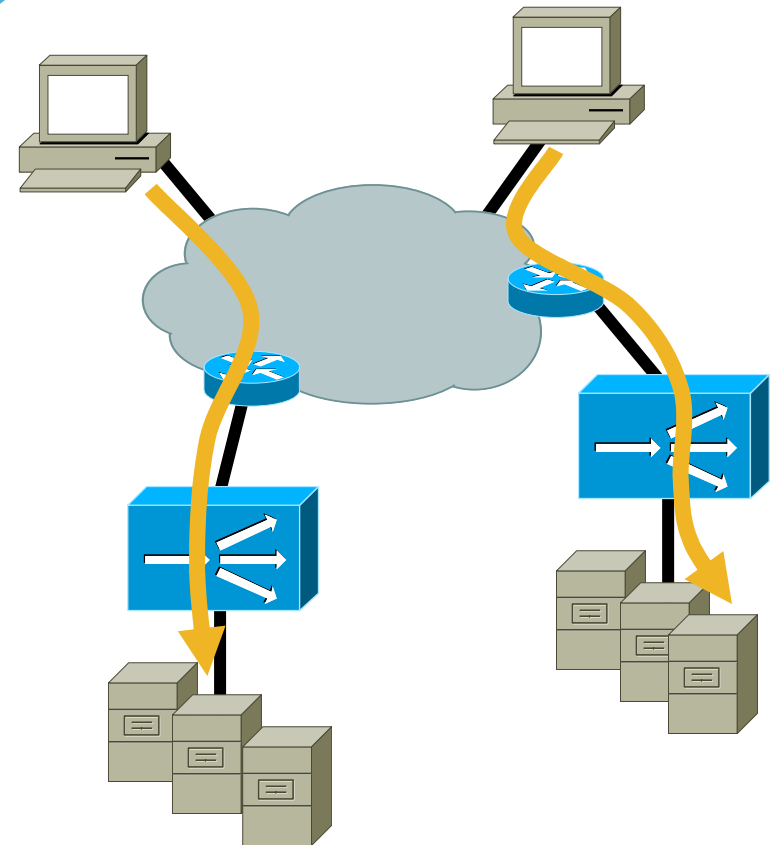
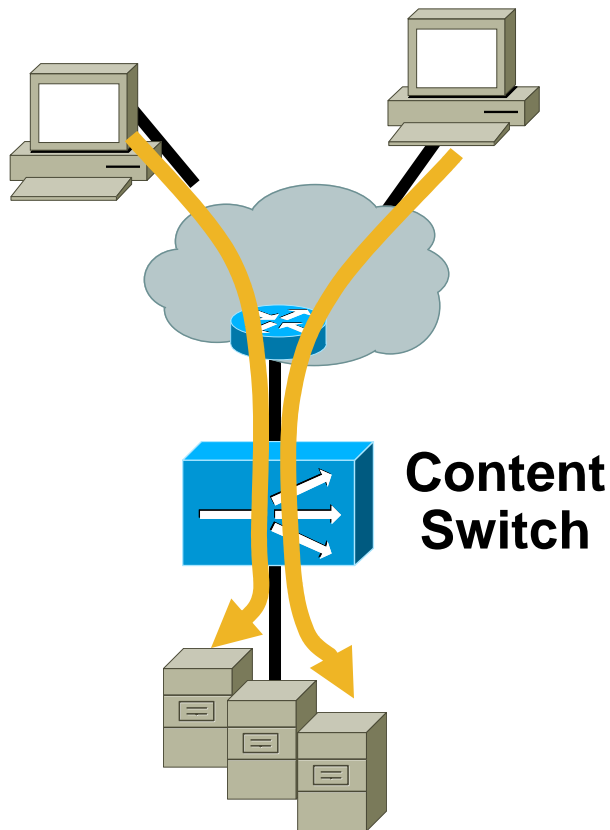
- Techniques used to distribute client traffic to servers across remote locations
- Very often deployed in conjunction with local load balancing (content switching)
- Often associated to DNS-based deployments
- DNS is not the only solution (and has specific limitations!)
- Can rely on dedicated products or leverage content switches functions

Geographic Server Load Balancing

SLB



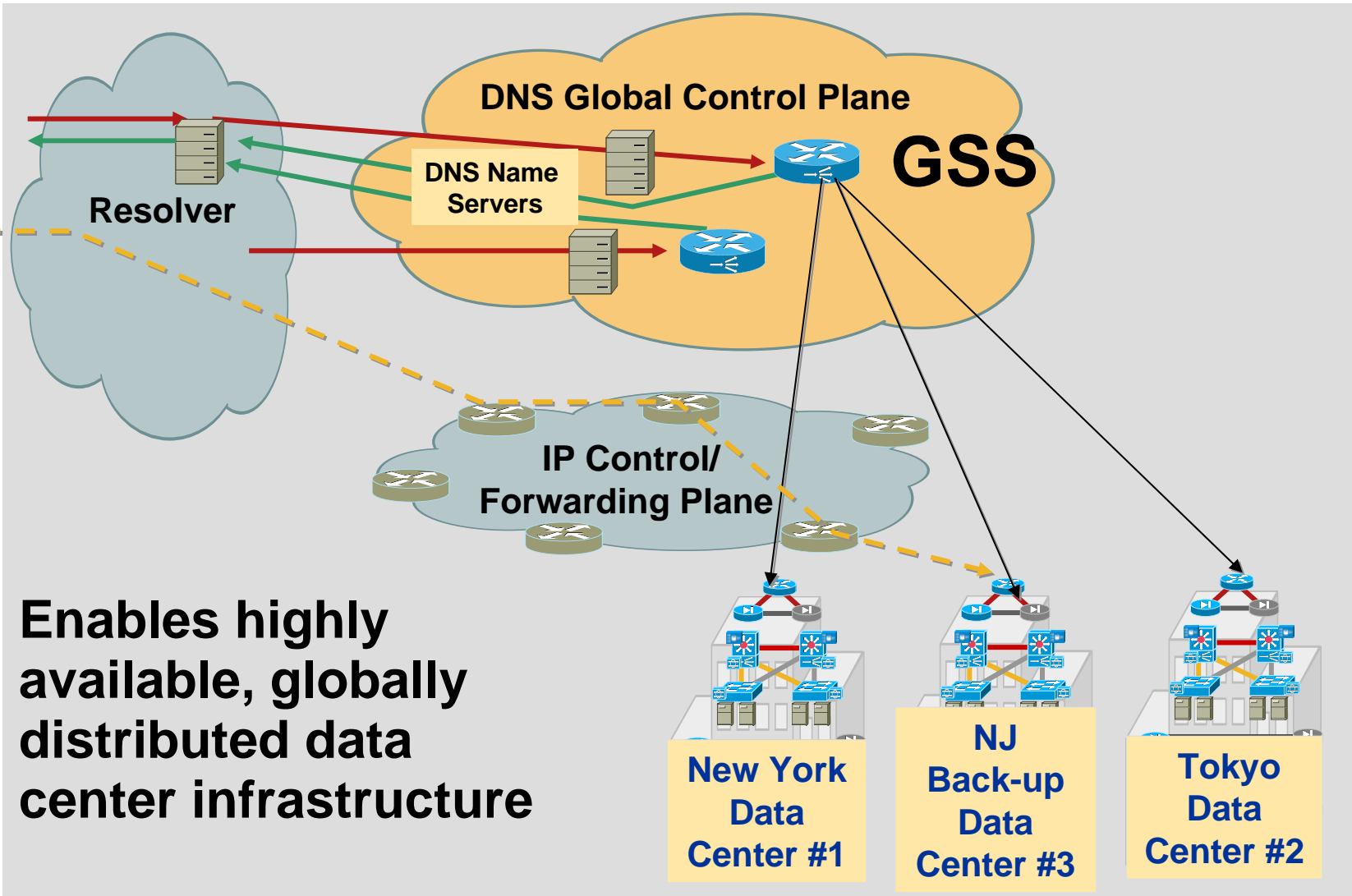
GSLB



Global Site Selector

Dedicated DNS Optimization Appliance

- Mobile
- Fixed Wireless
- Cable
- DSL
- Dedicated/ATM/FR
- ISDN/Dial



Agenda



- Application Challenges and Solution
- ACE Product Highlight
- Features and Benefits
- ACE Performance
- DCAP
- Global Server Load Balancing
- **Summary**
- Q&A



Cisco ACE Solutions and Benefits



Application Availability



Application Acceleration



Application Security



**Optimal TCO with
Virtualized Architecture**

- Minimize impact of application, device or site failure
- Maximize availability through highly scalable (1~64 Gbps) load balancing and content switching
- Improve end user productivity with up to 500% faster applications
- Improve server performance by offloading SSL, TCP, XML processing
- Comprehensive security for network, applications, XML and Web Services
- Provides last line of defense for servers
- Protects against day zero attacks
- Provides up to 400% reduction in power & cooling expenses
- Reduces CAPEX
 - Up to 65% fewer devices by cutting down sprawl & complexity
 - Up to 90% improved server CPU performance
- Provides up to 75% faster application deployments and build-outs
- Increases IT productivity
 - Save 2 to 4 weeks, deploy virtual devices, not physical devices
 - Save 6 to 8 trouble tickets & 2 to 4 days with Role Based Admin

