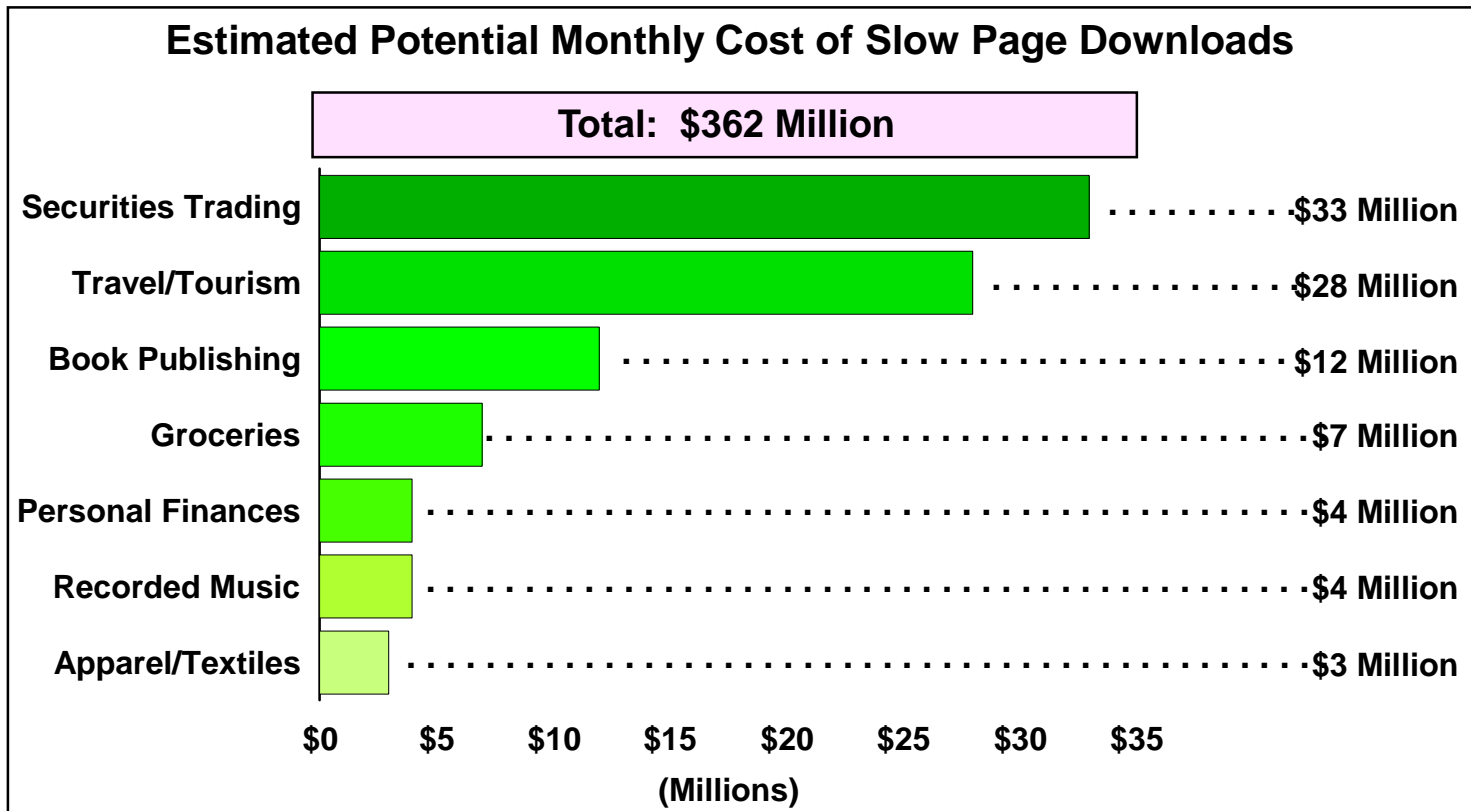


WebSphere Summit

Scalability and Performance

Slow Response Costs Money



- **Slow performance costs e-commerce sites \$362 million per month.**
- **Average web buyer will wait 8 seconds for a page to download.**
- **Longer download times can cause 30% of online buyers to bail out.**

Source: Zona Research

Friendly Finance

Business Manager

We need to easily accomodate rapid business growth and handle peak demand so we don't lose customers and money.



I/T Executive

We need good performance characteristics, scalability, and easy configuration management



WebSphere is the best.

WebSphere Advantages



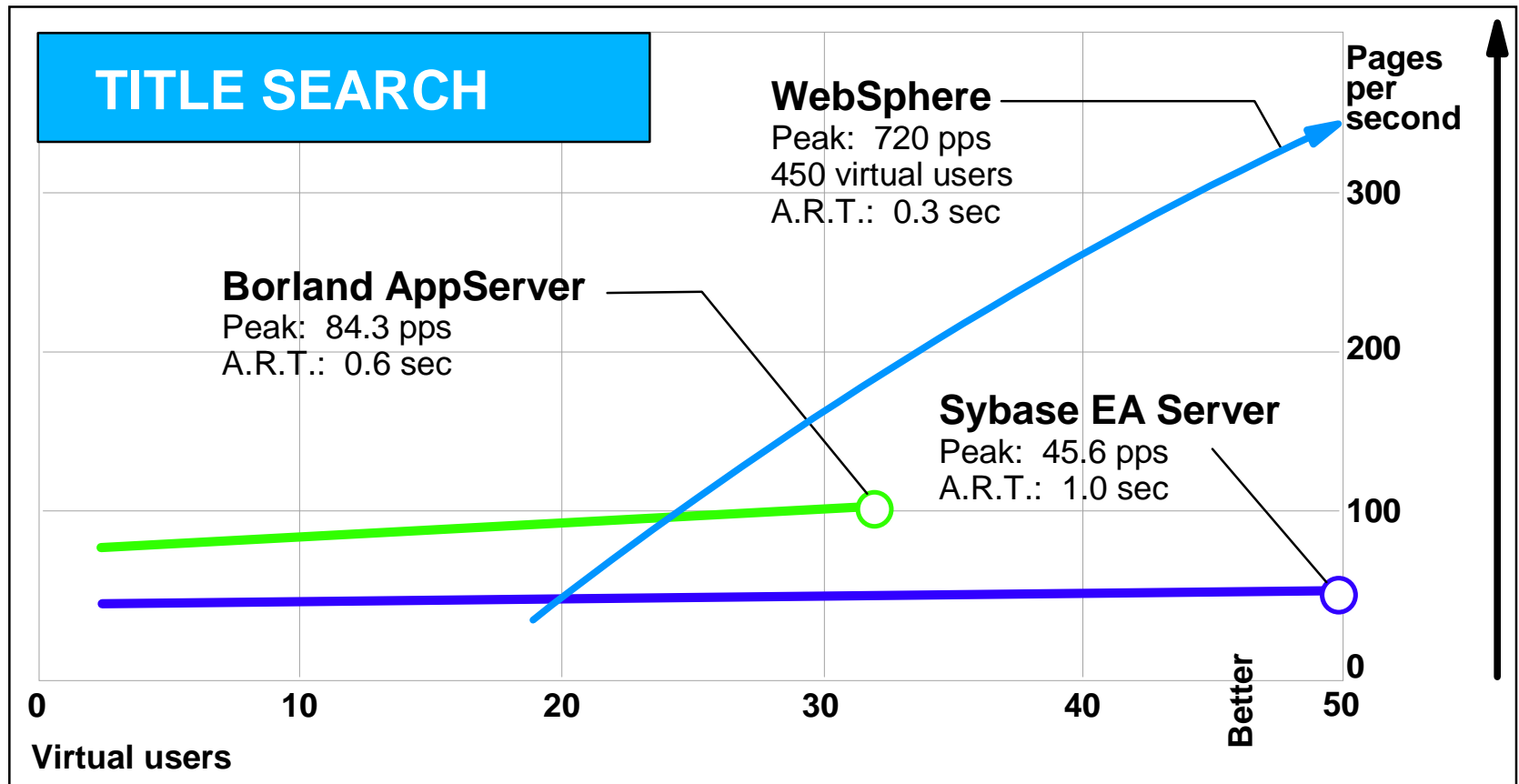
- WebSphere has better performance than BEA in enterprise class configurations
- WebSphere makes enterprise configurations easy to manage
- WebSphere's high performance is verifiable by high workload customer references
- WebSphere Edge Server adds distributed dynamic caching and load balancing for even more of an edge.

Site Performance and Reliability Considerations

- Inherent Application Server Performance
 - ▶ WebSphere Dynacache
 - ▶ Call by reference within JVM
 - ▶ Access bean caching (via tools)
- Multi-Tier
 - ▶ Separate the workload
 - ▶ RMI/IIOP performance
- Horizontal Scale
 - ▶ Workload balancing
 - ▶ Cluster failover
- Edge of Network
 - ▶ Push caching closer to user

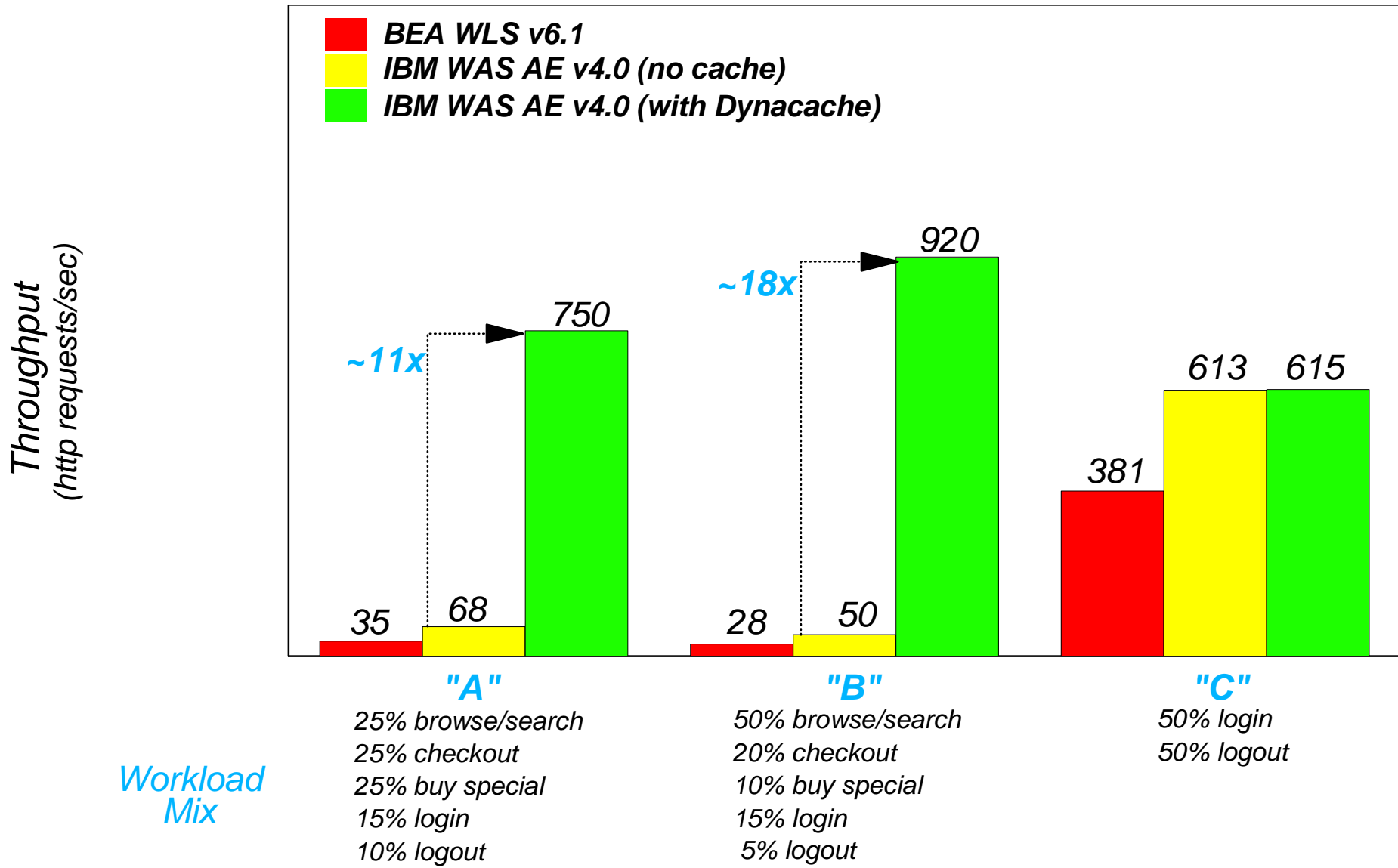
PC Magazine Independent Benchmark

Illustrates benefits of WebSphere dynamic page cache



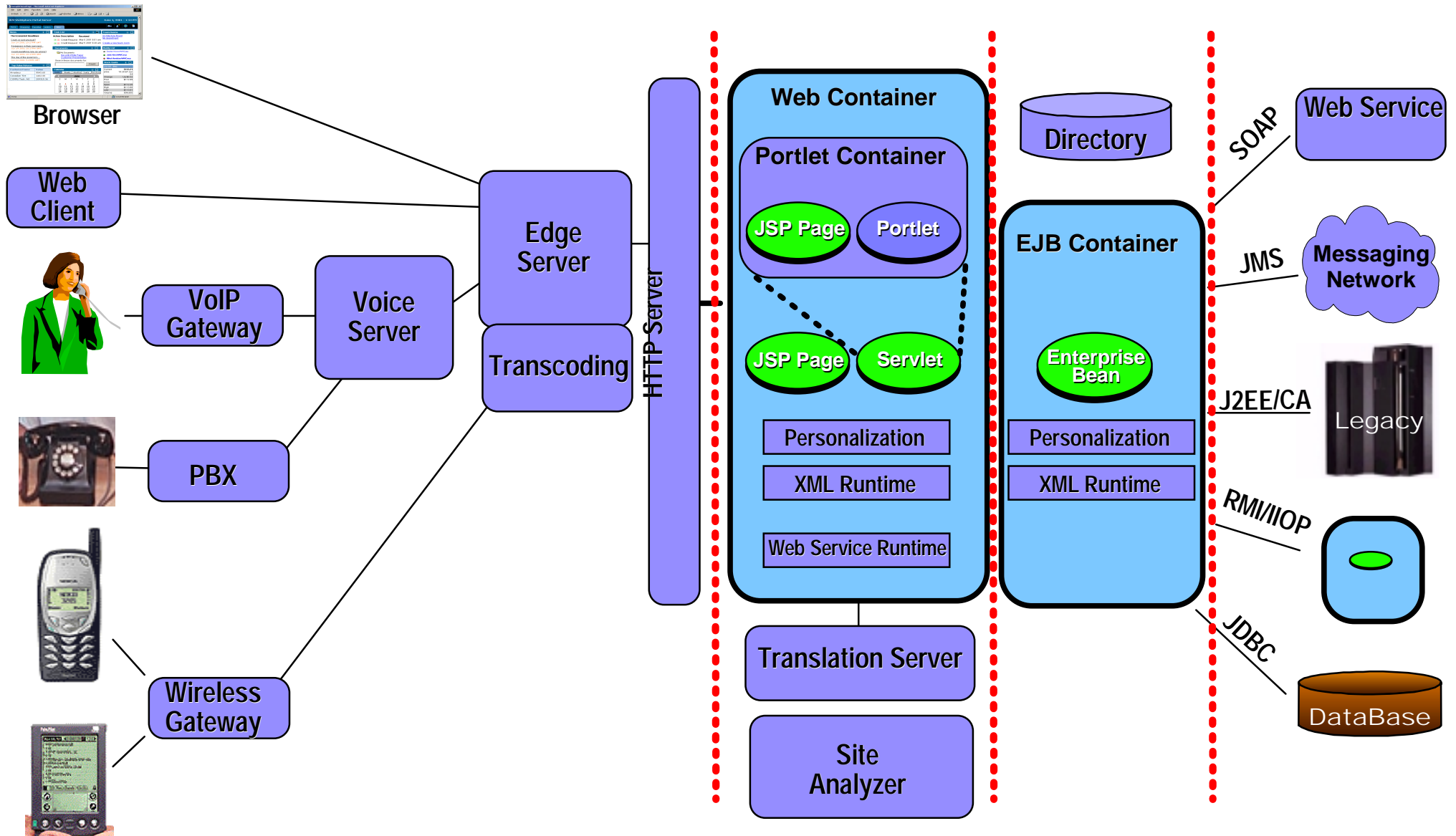
Note: BEA and Oracle refused to participate

IBM Re-Run of "Nile" Benchmark



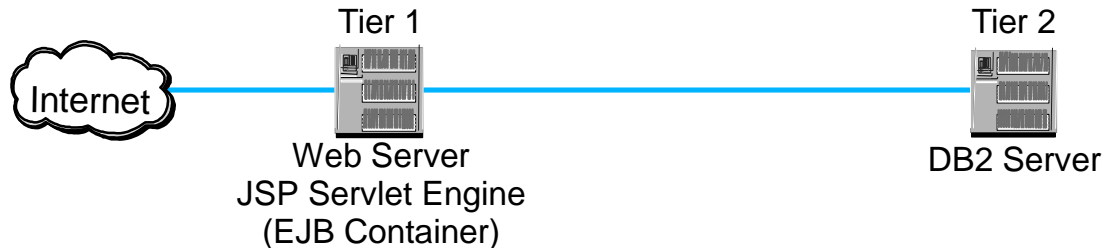
"A Performance Comparison of Application Servers on Windows 2000 Using the Nile.com Benchmark Application", A. Rindos, S. Woollet, T. Shanaberger, D. Shupp, C. Blythe, K. Ueno, 12/2001

WebSphere Platform Logical Elements Can Map to Separate Processor Tiers

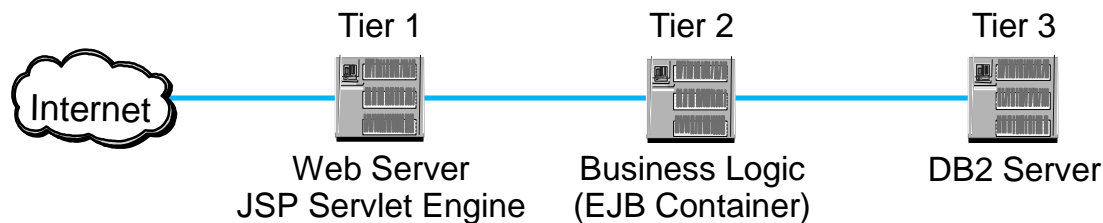


Multiple Tiers Isolate Containers for Security and Performance

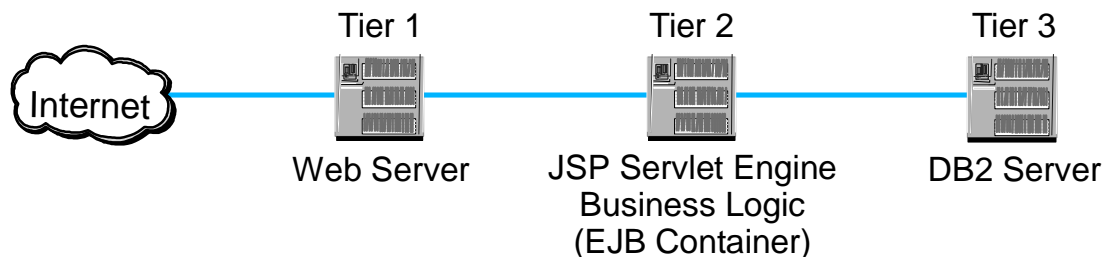
- eBay
- Disney.com
- Weather.com



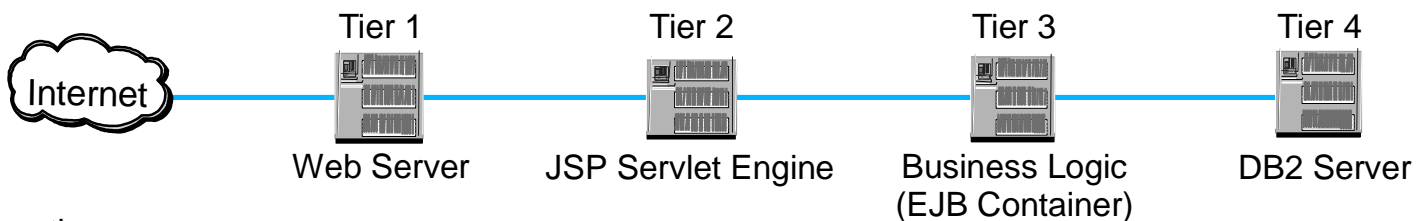
- Morgan Stanley
- Schwab
- Toronto Dominion Bank



- Aetna
- Rational



- France Telecom

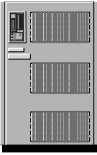
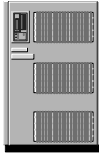
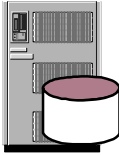
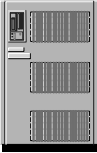
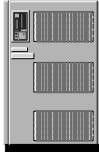
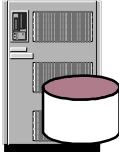
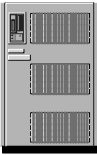
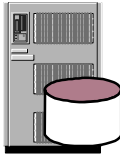
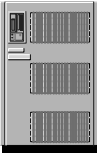
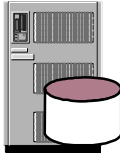


* Firewalls between tiers

Architectural choices driven by:

- Security - isolating vital resources from the Internet
- Geographical considerations - separate data centers
- Workload - distribute workload for performance

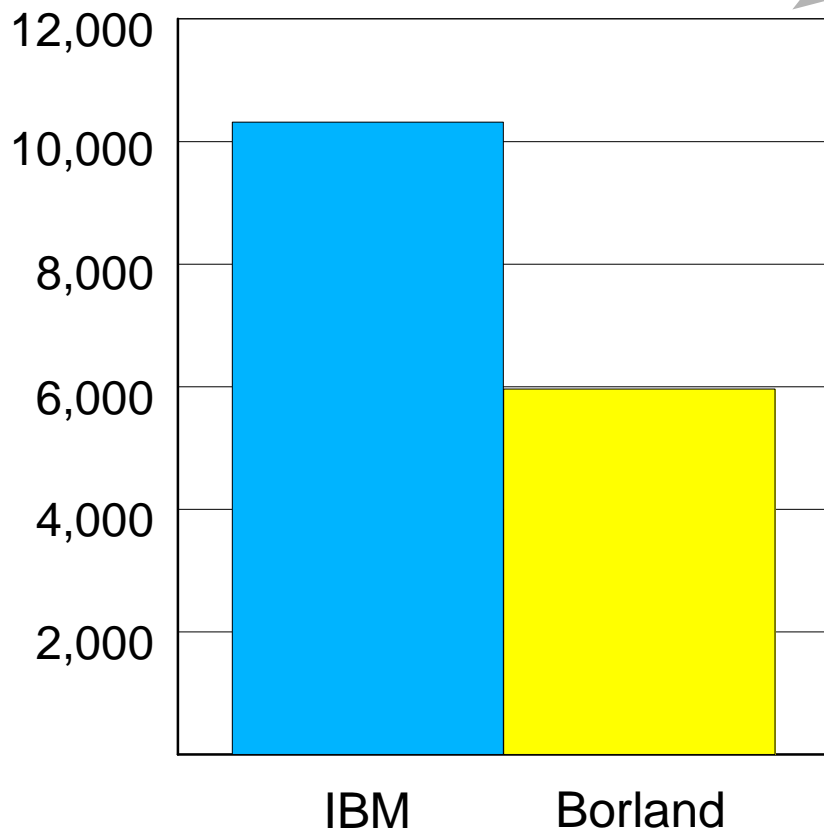
WAS v4.0.1 vs. WLS v6.1: Trade2 Benchmark

		Tier 1	Tier 2	Tier 3	Trade2 EJB	Trade2 JDBC
Split Business / Presentation Logic <i>TD Bank</i> <i>new Schwab</i> <i>Bank of Montreal</i>	real-world				+36%	N/A
		http Server JSP Servlet Engine	EJB Container	DB2 Server		
HTTP Proxy to Application <i>current Schwab</i> <i>J.P. Morgan</i> <i>Morgan Stanley Online</i>	real-world				+38% <i>(with Dynacache)</i>	+53%
		http Server	JSP Servlet Engine EJB Container	DB2 Server		
"All-in-One" with Apache (IHS) <i>simple evaluation</i>	lab benchmarking				+16%	+32%
		http Server JSP Servlet Engine EJB Container	DB2 Server			
"All-in-One" with native HTTP <i>simple evaluation</i>	lab benchmarking				(3%)	+24%
		"native" http Server JSP Servlet Engine EJB Container	DB2 Server			

WebSphere: Industry Leader in Enterprise Business Transactions

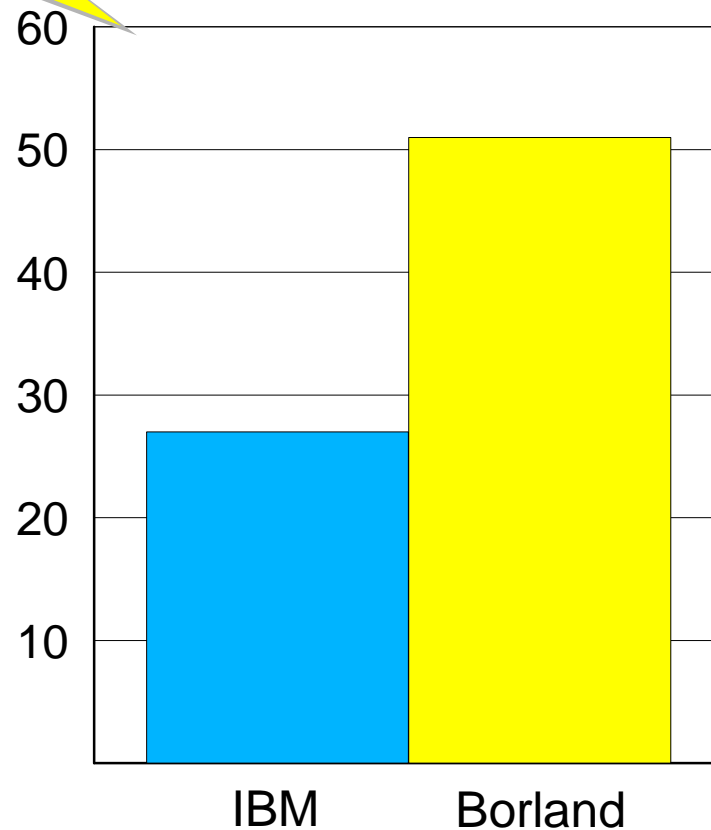


Performance
(Bbops/min)



WAS has almost twice the performance at half the cost!

Price/Performance
(\$/Bbops/min)

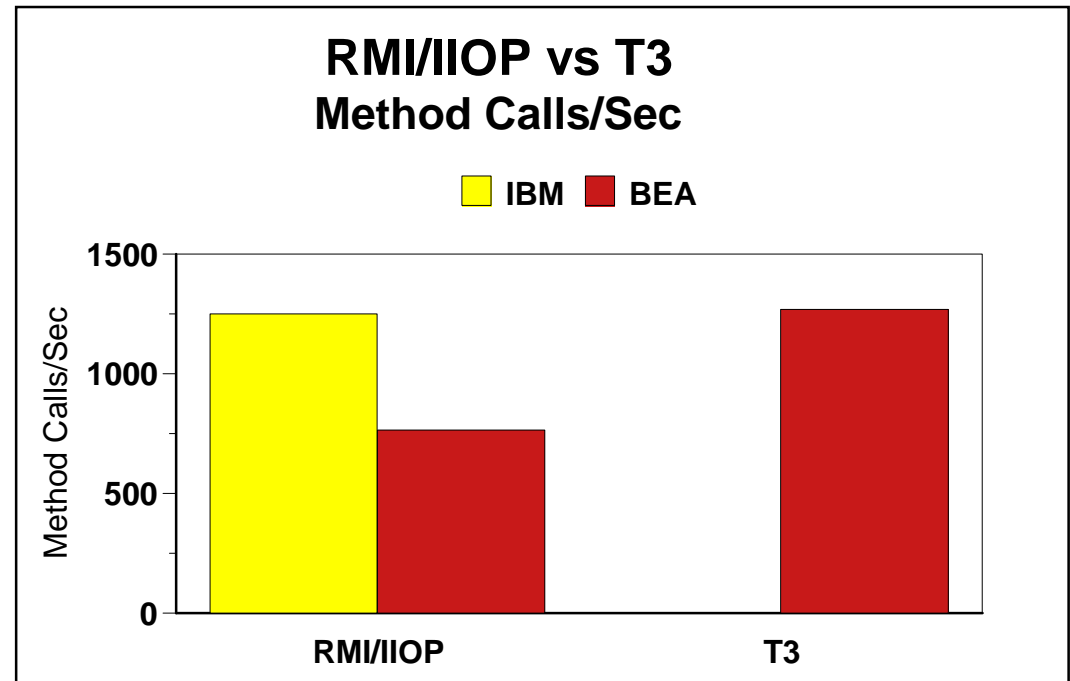
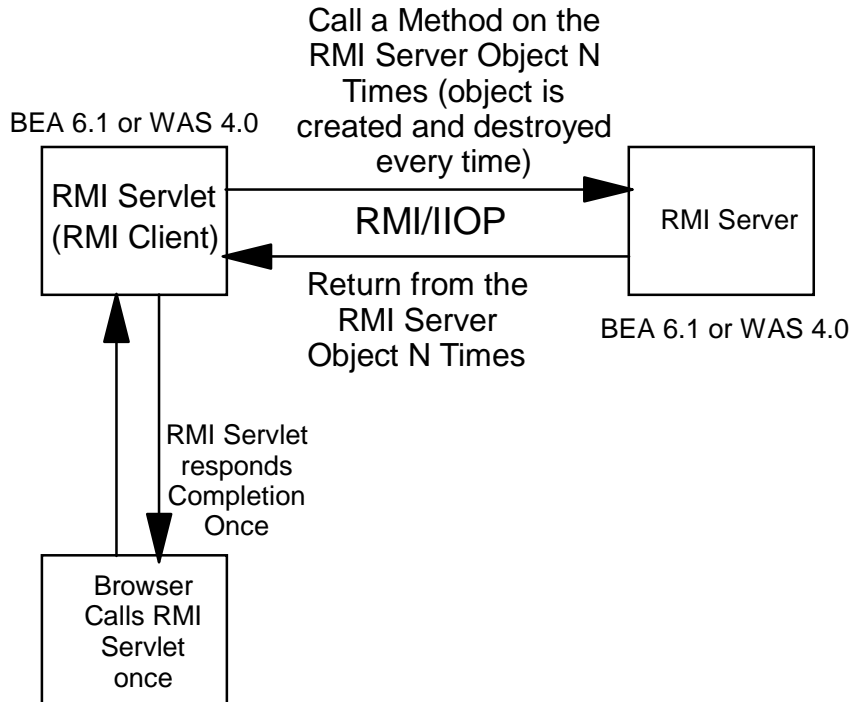


Multiple Tiers

- BEA does not offer a separately installable http server
- RMI/IIOP is a multi-tier requirement
 - ▶ Connects Web Containers to EJB Containers
 - ▶ WebLogic still clings to proprietary T3 protocol
 - Defaults to T3
 - Recommends T3 for better performance
 - ▶ WebSphere implementation is 63% faster than WebLogic

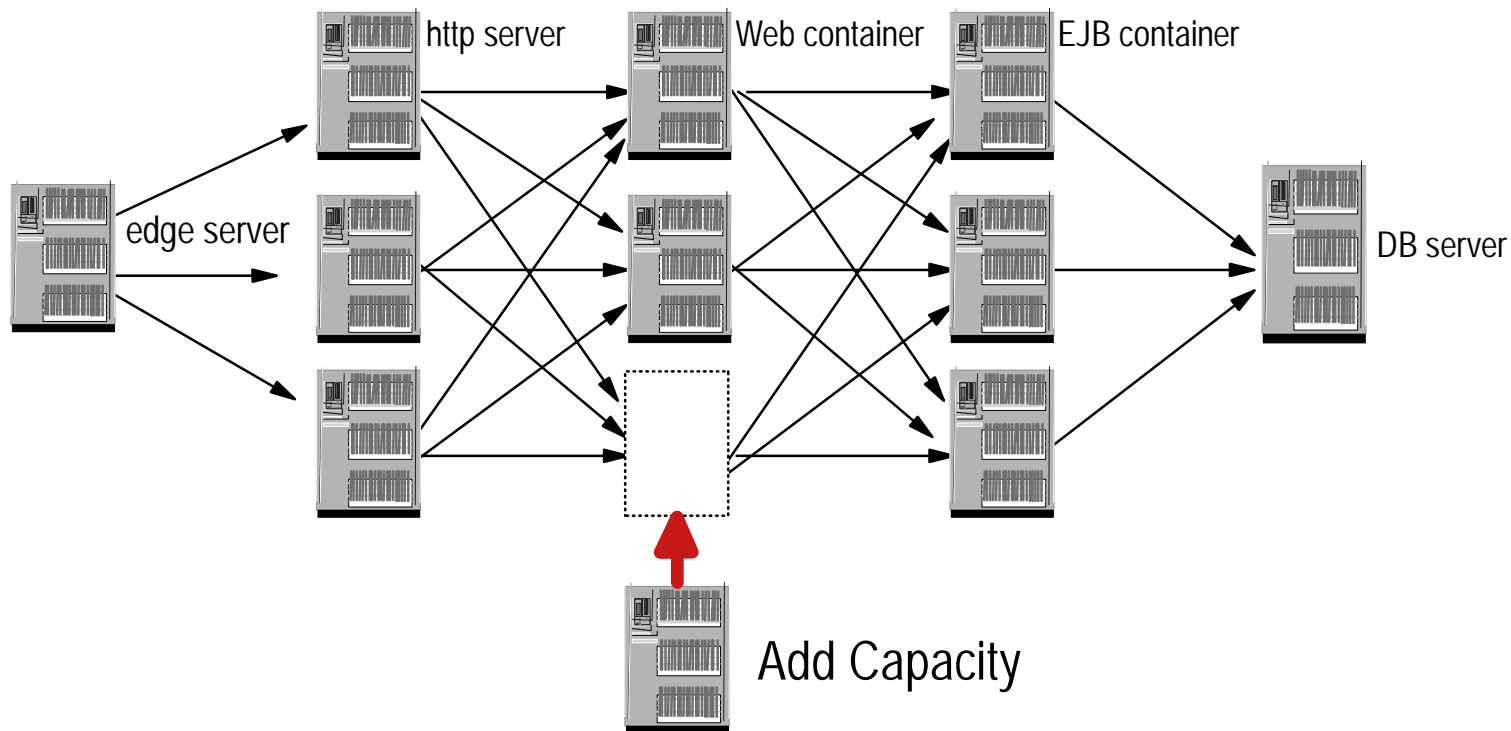
WebSphere RMI/IIOP - Benchmark Primitive

*WebSphere IIOP
is 63% Faster*

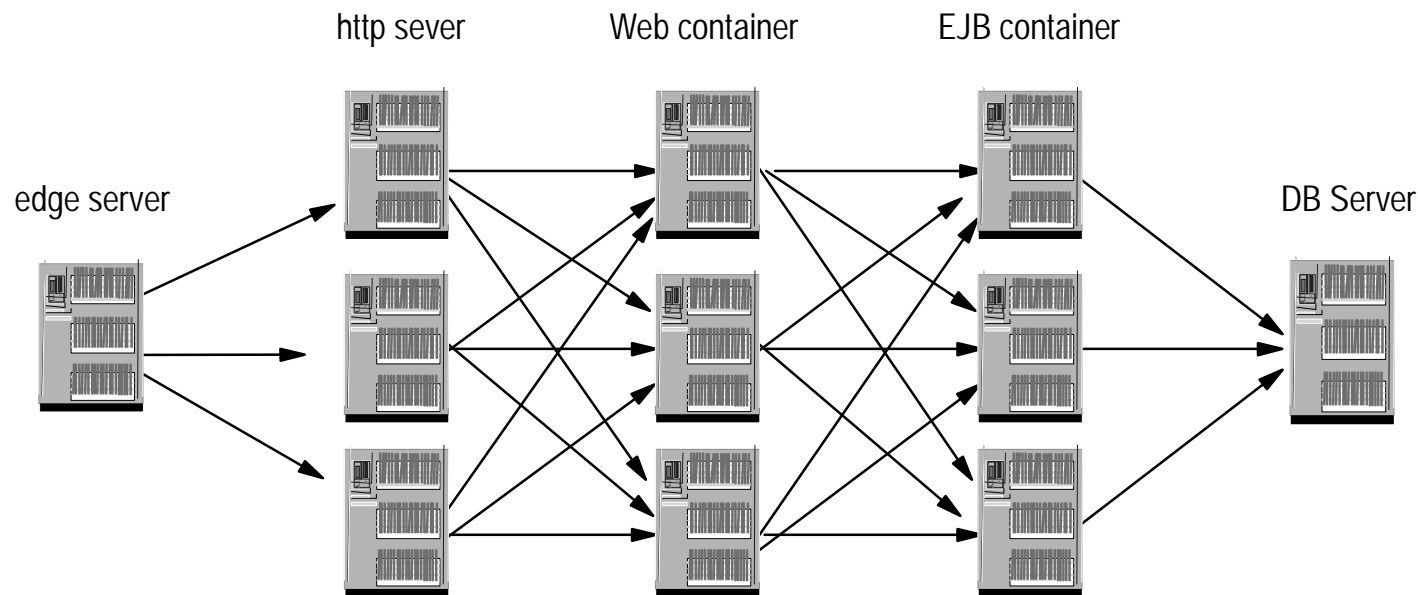


Horizontal Scale

- **Workload Balancing**
 - ▶ Easily manage workload balancing among multiple servers
 - ▶ Add capacity without outages
- **Can configure for cluster failover**
 - ▶ Superior WAS architecture is simpler and more reliable



WebSphere Workload Balancing



- Automatic distribution of workload within each tier
- Easy to add servers for more capacity
 - ▶ No outages
 - ▶ No manual steps
 - ▶ One-click web server plug-in configuration

Demo 1

Open WAS Admin Console

Create a new clone for the server group

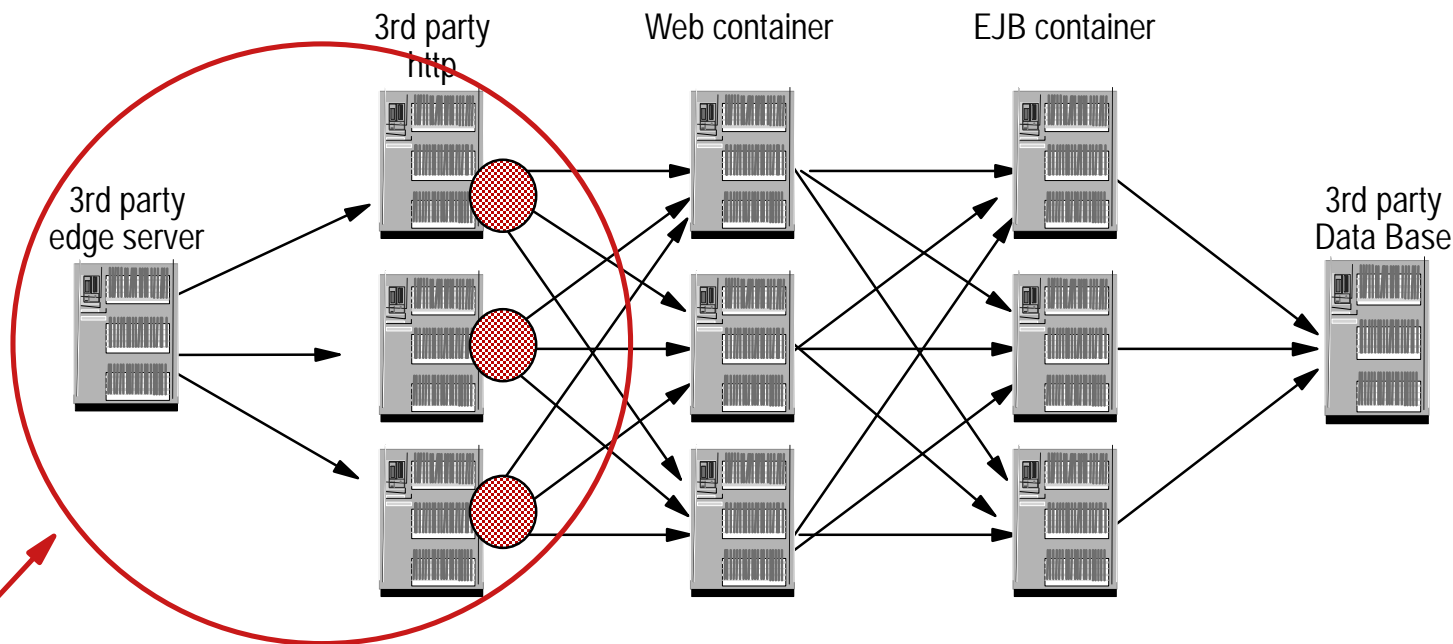
Complete Steps to Add Capacity

- WebSphere
- New Server Machine
 - ▶ Install WAS 4.0
 - ▶ Configure new instance to belong to domain.
- Define Clone on new instance.
 - ▶ Copy code directory.
- Start clone.
- Regen web server plug-in.

- WebLogic
- New Server Machine
 - ▶ Install WLS 6.1
 - ▶ Configure new instance to belong to domain.
 - ▶ Configure Node Manager on new instance.
- Define Clone on new instance.
 - ▶ Configure ports for clone.
 - ▶ Configure WLM for clone.
- Start Clone.
 - ▶ Wait for code to transfer.

More manual,
error-prone
steps

WebLogic Workload Balancing

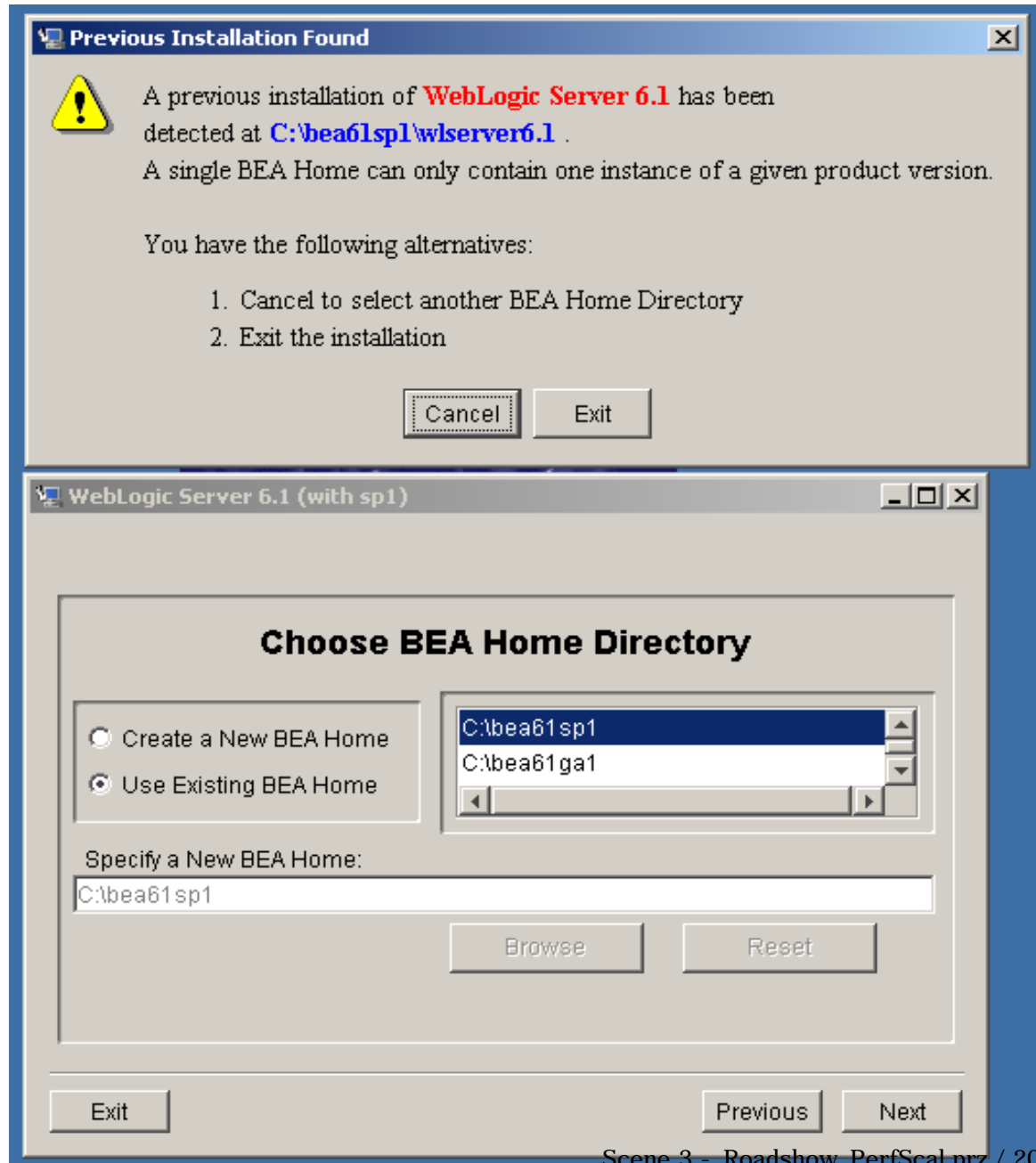


- BEA does not offer an edge server or an http server
- Not as easy to add a server
 - ▶ Manual steps
- Changing configuration settings frequently requires WebLogic restart

Demo 2

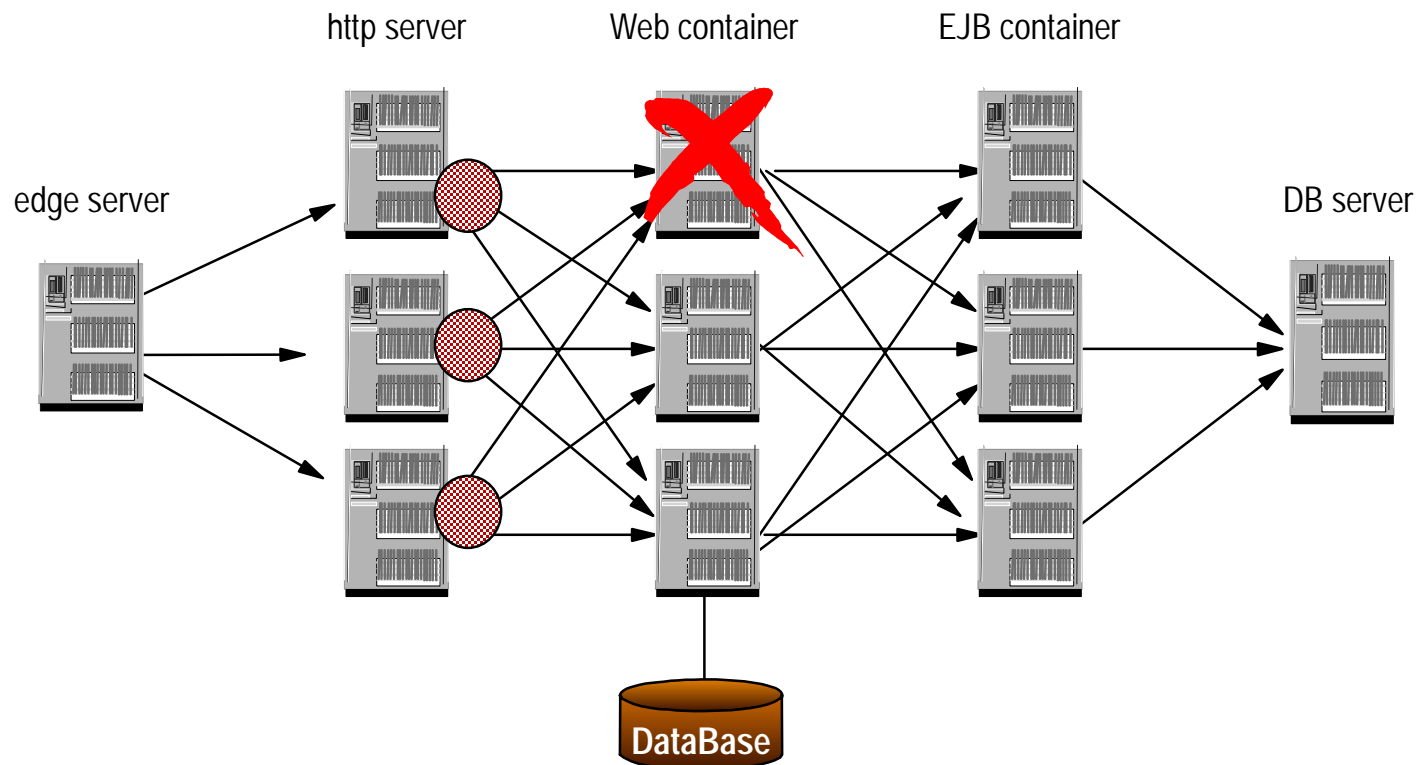
Open BEA Admin Console
Change some simple parameters
Show 24X7 myth

So, you want to install a Service Pack on BEA?



- Original version of WLS v6.1 did not support the use of Node Manager for setting up clusters
- BEA issued Service Pack in late 12/01 to fix problem
- BEA Service Packs are essentially a re-install of WLS
 - *not an add-on to an existing installation like WebSphere*

WebSphere Cluster Failover

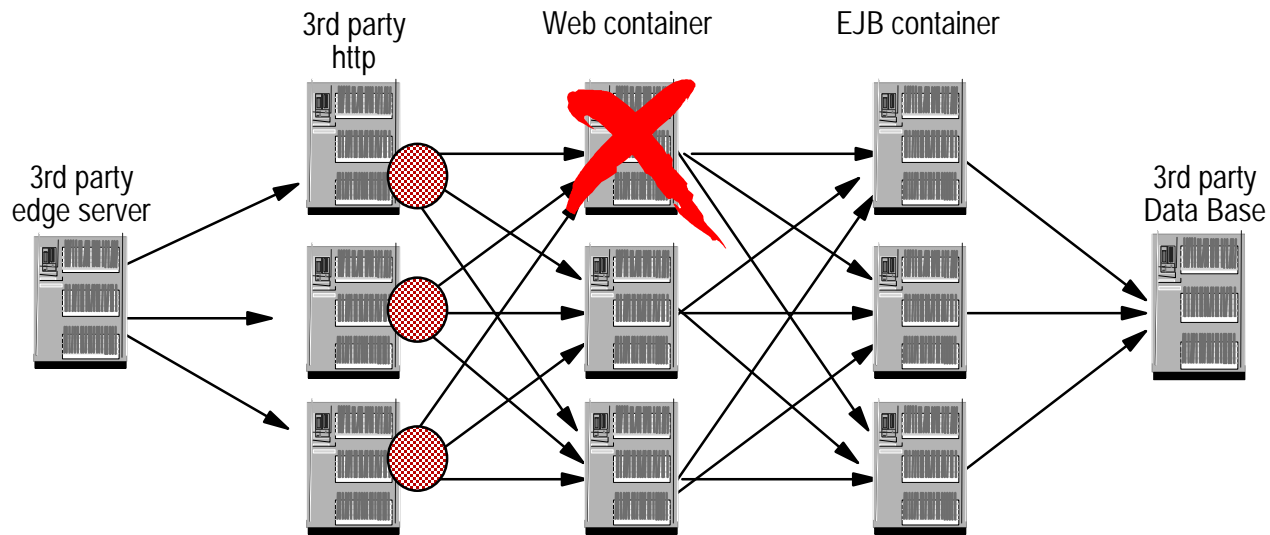


- Persistent session data shared in common database
- Easy to configure for failover
 - ▶ If any server(s) drops out, the remaining servers balance the workload
- Auto restart will re-establish original balance

Demo 3

WAS Load Balancing and Failover
Show superior strength of WAS

WebLogic Cluster Failover

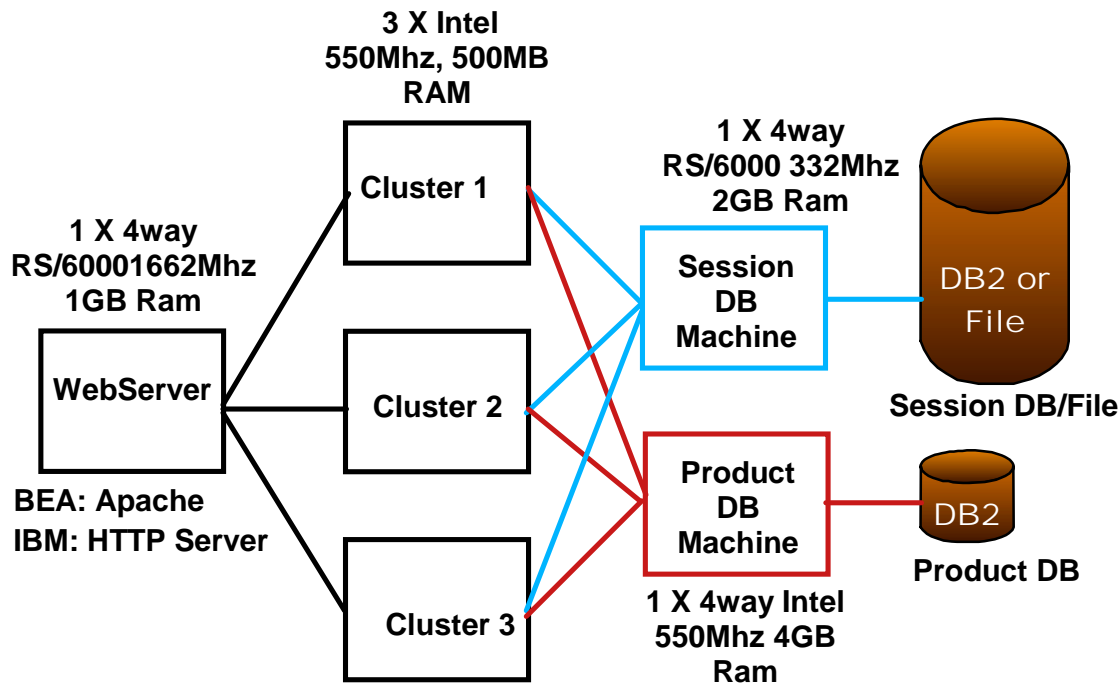


- No auto restart
- Only supports simple fail-over
 - ▶ no load re-balancing after failed server comes back online
- Clustering performance and reliability is inferior to WebSphere

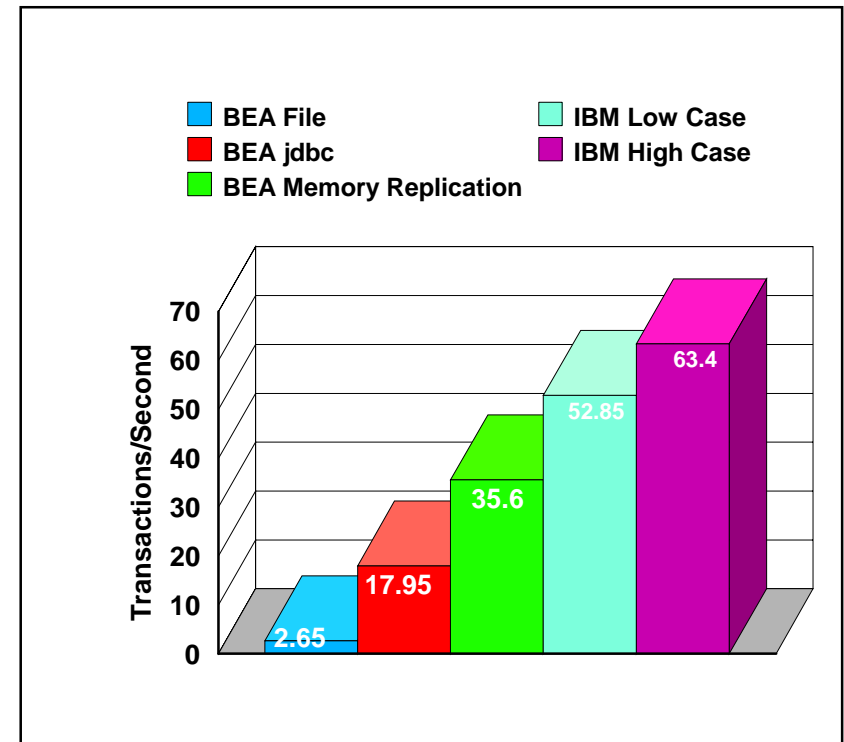
WebSphere Failover Configuration Benchmark

WebSphere Performs 3 to 3.5 times faster

Trade2 EJB

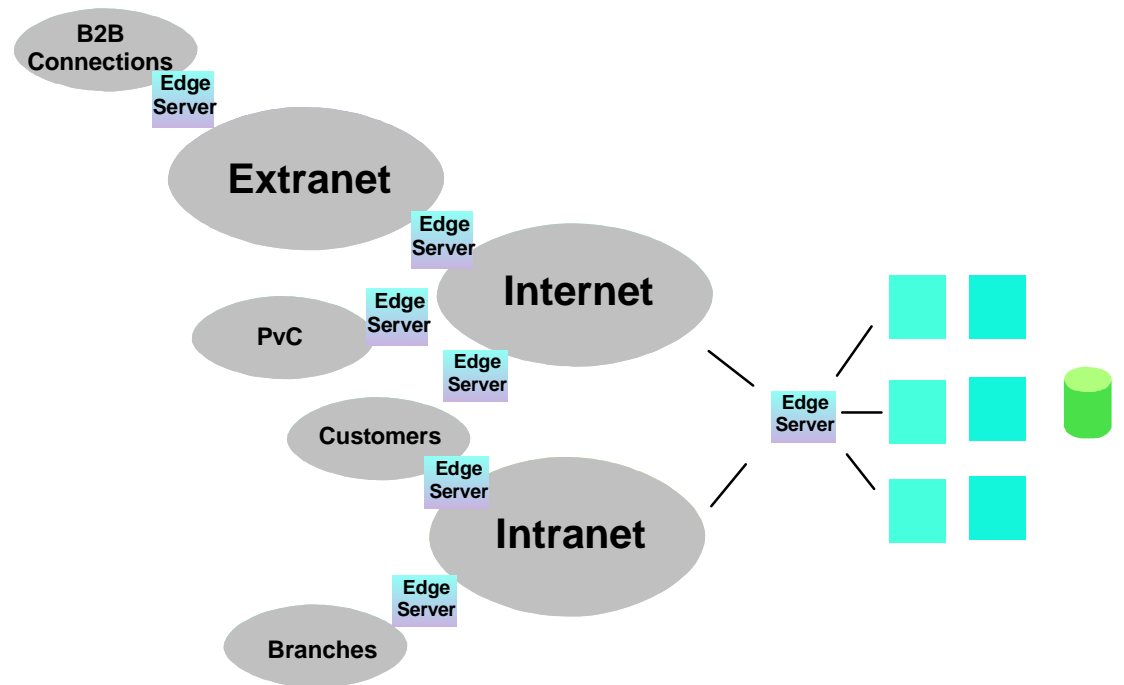


Failover Configuration Benchmark



WebSphere Edge Server Extends Support to Edge of Network

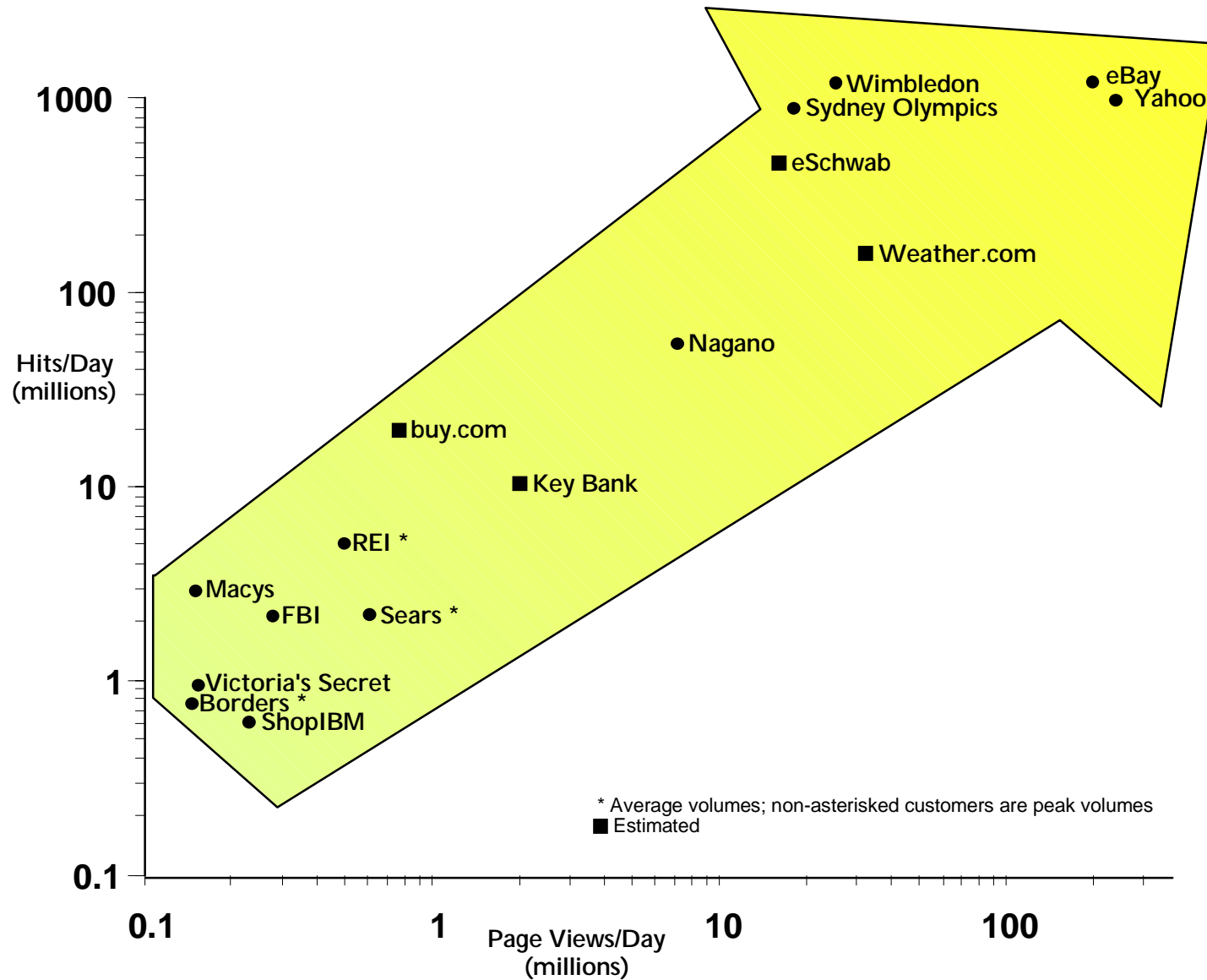
- Balances web application processing loads intelligently across clusters of Http servers and clusters of cache servers.
- Uses open APIs in WebSphere to magnify the impact of Dynacache by bringing the cache closer to end users.
- Enables content based management of routing to provide for quality of service for web applications.
- Interfaces with caching and content distribution agencies in the internet to improve application response time.



- **Load balancing/Clustering**
- **Caching**
- **Filtering**
- **Traffic Management**
- **Content-based routing**

Customer Metrics Examples

Peak Hits & Page Views Per Day



Weather.com

- 2 million visitors per day, **33.7 million** page-views per day , 250,000 pages of content
- WAS 3.5, Sun servers
- "Websphere came out on top across all dimensions. Most importantly, it ran **much faster than Weblogic** for what we needed it to do", says Dan Agronow, VP Quality Control Testing and Operations

The screenshot shows the Weather.com website interface. At the top, there is a navigation bar with links for "Forecast & Maps", "Activities", "Interact", "News Center", "Services", and "My Weather". Below this is a search bar with the text "Enter city or US zip:" and a "GO" button. To the right of the search bar, there are examples of search terms: "e.g. '30339', 'Atlanta', 'Houston, TX', 'Paris, France'". Below the search bar is a secondary navigation bar with links for "Local", "Health", "Travel", "Recreation", "Home&Garden", "Driving", and "Work Site". Below this is a third navigation bar with links for "Homepage", "Local Outlook", "Averages & Records", and "Maps".

The main content area is divided into several sections:

- News Center:** A section titled "Summer doldrums" with a sub-headline "A lazy front produces heavy thunderstorms in the Midwest while hot and extremely humid air steams the central and southern Plains plus much of the Mississippi and Ohio valleys." and a link for "More details".
- Maps:** A section titled "Maps" with a sub-headline "ORBITZ The Most Low Fares!". Below this is a temperature scale and a "Today's Forecast" map for "Highs/Weather Aug 02, 2001".
- Highlights:** A section titled "Highlights" with a sub-headline "Summer Driving" and a sub-headline "Summer is the perfect time of year to take a drive along some of the country's most beautiful and picturesque byways."

At the bottom of the page, there is a banner for "free credit report online!" with the text "Click here for your free credit report online!".

US Open/ Wimbledon

- Exceeded **1 million** hits/min, 2 million unique users, 30K simultaneous access of scoreboard application
- Similar results were achieved for the Wimbledon, Australian and French Open
- Software: WAS, Edge server, DB2, IBM Gryphon 1.0 Messaging technology, Lotus Domino, Tivoli, WCS, Linux
- Hardware: p-Series RS/6000 SPs, RS/6000 workstations, x-Series Netfinity 4000R, ThinkPads, Intellistation M Pro Computers, PC

<http://www.usopen.org>

The Official Web Site of the 2001 US Open
www.usopen.org is an IBM e-business

A USTA EVENT

TICKETS SCOREBOARD NEWS & VIEWS PLAYERS MOBILE OPEN
DRAWS LIVE @ THE OPEN TOURNAMENT GUIDE US OPEN STORE

IBM | e an e-business sports solution

August 27 to September 9

IBM Real-Time Scoreboard >>>

Schedule of Play • Feedback • Register

TOP STORIES

> HEADLINES
Poll: name the greatest moment from the 2001 US Open.
[US Open Sets Attendance Record](#)
[Off-Court Records Set During the 2001 US Open](#)
[2001 US Open Notebook](#)
[2001 US Open Honor Roll](#)
[Venus Defends Her](#)

Awesome Aussie
In a brilliant performance, Australia's Lleyton Hewitt won his first Grand Slam title Sunday with a three-set thrashing of four-time champion Pete Sampras, the second straight disappointment for Sampras in the US Open men's final. Earlier, top seeds Lisa Raymond and Rennae Stubbs beat Kim Po-Messerli and Nathalie Tauziat for the women's doubles crown. Get all the news from two glorious weeks of tennis, including Venus Williams' win over sister Serena Saturday night, in [News and Views](#).

> Hewitt Races to First Title
Putting on possibly the most impressive display of return of serve seen during the Open era, Aussie Lleyton

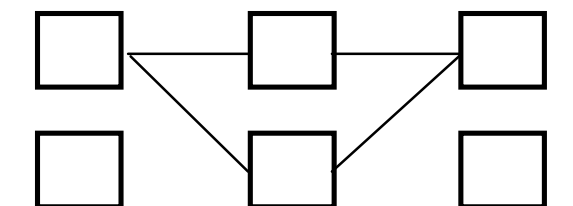
Visit the Official
[US Open Store](#)

Summary Scoreboard

	match complete
L Hewitt	7 6 6
P Sampras	6 1 1
S Williams	2 4
V Williams	6 6

Schwab Brokerage/Trading Applications

- Barista II proof of concept project
 - ▶ Separate tier for EJB business logic
 - ▶ Demonstrate scalability and administration of large scale domain
 - ▶ Heavyweight account overview pages
- 350 pps with 67% CPU utilization on servlet nodes and 73% on EJB nodes
- 1.4second response time
- Demonstrated capability to meet production requirements of 16.5 million transactions per day (Peak/average ratio is 8.7)



servlet
44 nodes

EJB
15 nodes

data
15 nodes

RS/6000 Winterhawk II

Charles Schwab Customer Center | Account | Trade | Quotes & Research | Alerts | Planning | Service

Overview | Balances | Positions | Performance | Monitor | History | Move Money

Urgent Notification: Thank you for using Schwab's Internet Services. [Details]

Switch Account: 39100906 [Customize] [Help]

Account Information		Positions (Delayed)	
! Money is currently due in the account. See Balances for information.		Last	Change
Margin Buying Power	\$0.00	0	No info available
Securities Market Value	\$11737.50	1502808	No info available
Total Cash	(\$15029.95)	AMZN	63.03 -0.47 [Trade]
Total Account Value	(\$3292.45)	AOL	56.25 -0.25 [Trade]
		BARAX	61.61 -0.16 [Trade]
		CMCSA	38.44 +0.00 [Trade]
		DELL	45.81 +0.06 [Trade]

Conclusions

- WebSphere has better performance than BEA in enterprise-class configurations
- WebSphere makes enterprise configurations easy to manage
- WebSphere's high performance is verifiable by high workload customer references
- WebSphere Edge Server adds distributed dynamic caching and load balancing for even more of an edge.

Thank You

ECperf - "Industry's First EJB Benchmark"

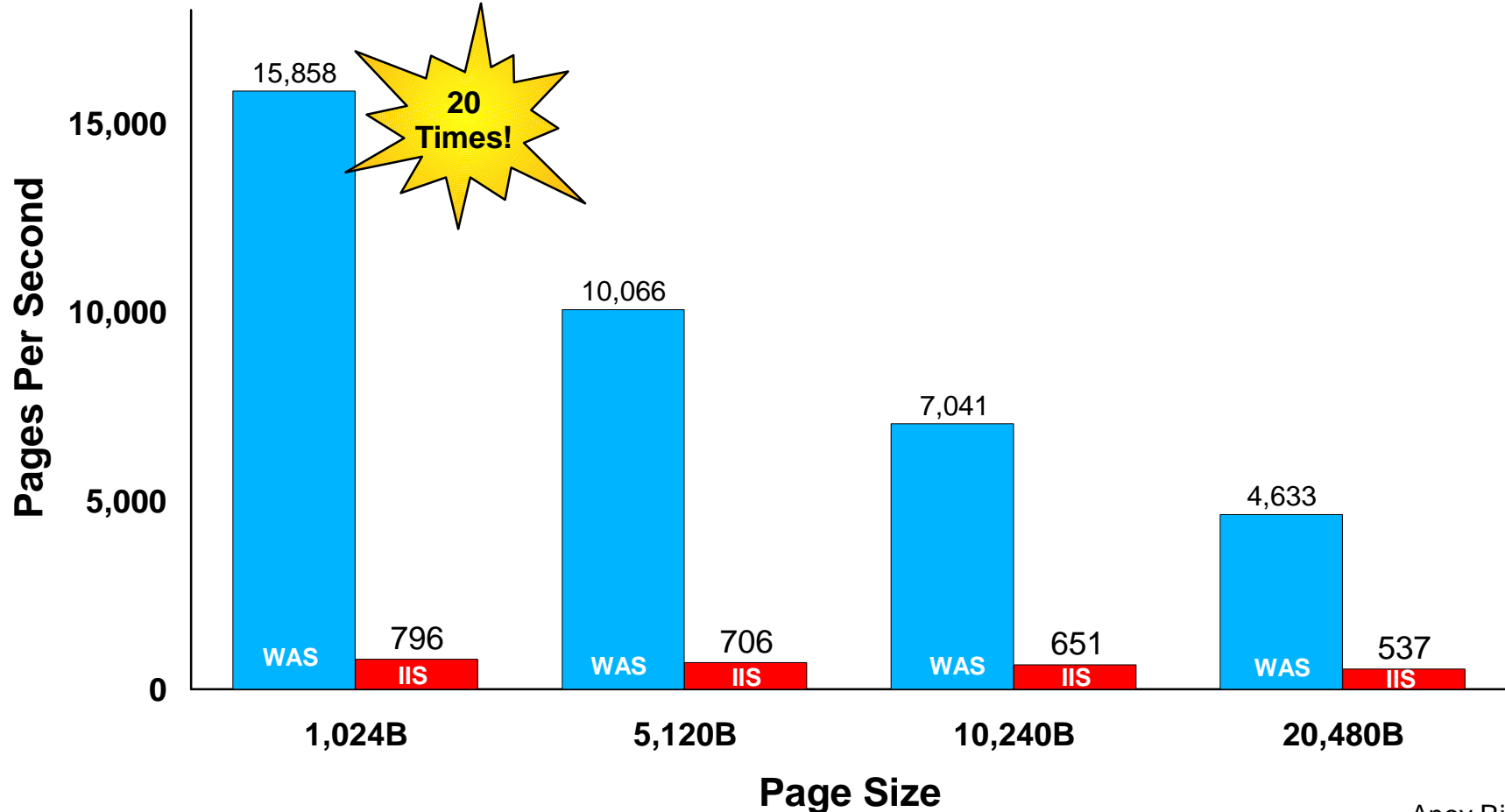
what is it

- ▶ **ECperf** is a Enterprise JavaBeans(EJB) benchmark meant to measure the scalability and performance of J2EE servers and containers.
- ▶ Developed under the Java Community Process (JSR 131) with contributions from Sun, IBM, Borland, BEA, Oracle and others.
- ▶ Stresses ability of EJB containers to handle the complexities of memory management, connection pooling, passivation/activation, caching, etc.
 - (GUI and presentation are not the focus of the ECPerf workload, nor are aspects of everyday DBMS scalability (e.g., database I/O, concurrency, memory management, etc.). These are adequately stressed by other standard workloads such as TPC-C, TPC-D, TPC-W, etc.)



WAS 4.0 Outperforms Microsoft IIS/ASP By 20 to 1

- Illustrates benefit of dynamic page cache
- Repetitious page requests
- IBM Netfinity 7000 M10 Server (4 way 500 MHz, 1GB Ram, Four 1G bit adapters)

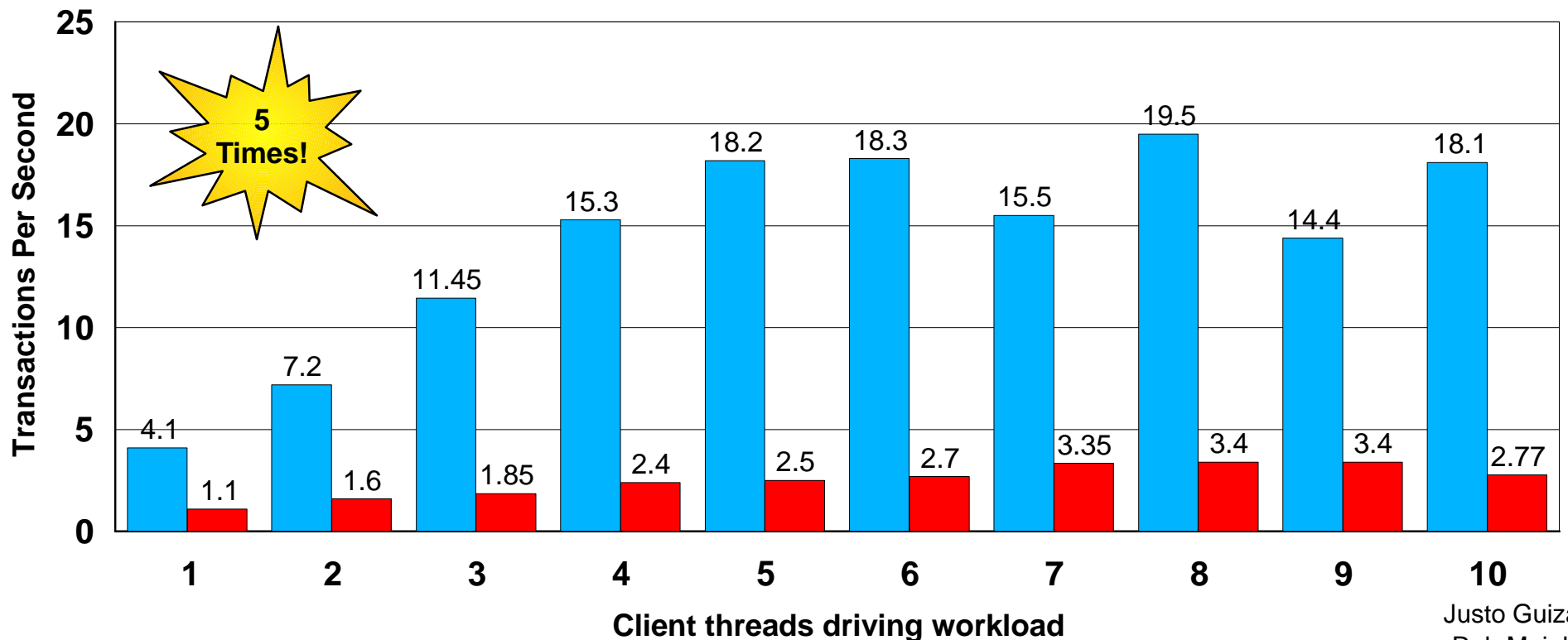


Anoy Rindos, et. al.

WCS 5.1 Outperforms BEA Commerce 3.5 by 5 to 1

- Demonstrates Access Bean and call by reference advantages
- IBM Netfinity M20 4 way 400 MHz, 4GB (IBM using DB2 7.1, BEA using Oracle 8.1.6)
- Both products configured out of the box
- Illustrates how poorly BEA WLS supports a real-world application

■ Transactions-WCS ■ Transactions-BEA



Justo Guizan
Rob Maiolini

WAS 4.0 for z/OS and OS/390 is a Native Implementation

- Optimized to exploit z/OS scale and reliability
- Exploits DB2 sysplex scalability
- Integrated with zOS workload management
 - ▶ manage priority at the level of users and groups
- Integrated with Cisco network quality of service
 - ▶ maximize throughput for the highest priority transactions
- RMI/IIOP over Hypersockets (high speed interconnect)
- RACF security
 - ▶ intrusion protection
 - ▶ access control down to individual sockets