BEA WebLogic JRockit:
Java Virtual Machine For Intel Server Platforms

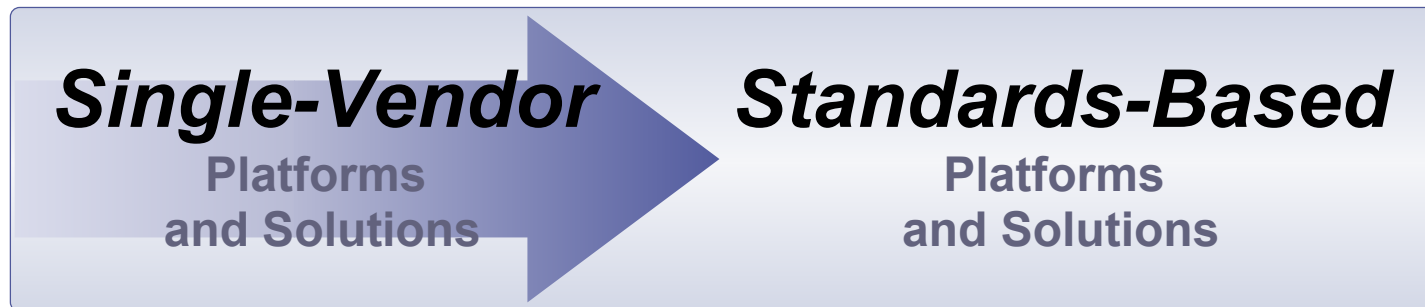### Arvind Jain

Product Manager
BEA Systems, Inc.

HP WORLD 2003
Solutions and Technology Conference & Expo

Customers Driving Paradigm Shift Towards Intel Servers

Intel Servers Outpacing Single-Vendor RISC Servers

Single-Vendor **Platforms and Solutions** → *Standards-Based* **Platforms and Solutions**

- Improved price/performance
  - Higher performance than RISC processors
  - Available at fraction of cost of RISC-based servers
- Greater flexibility
  - Standardized hardware building blocks
  - Quickly scale infrastructure to handle growth
  - Increased choice of H/W and O/S vendors

Until Recently, Enterprise Java Was Not Considered Feasible On Intel...

- Poor performance
  - Java Virtual Machine not optimized for Windows and Linux on Intel servers
- JVMs optimized by H/W vendors for their own RISC systems
  - Sun, IBM, HP, etc.
  - No motivation to optimize for Intel servers

Java App.	Java Code
JVM	Translator
OS	Platform
Hardware	
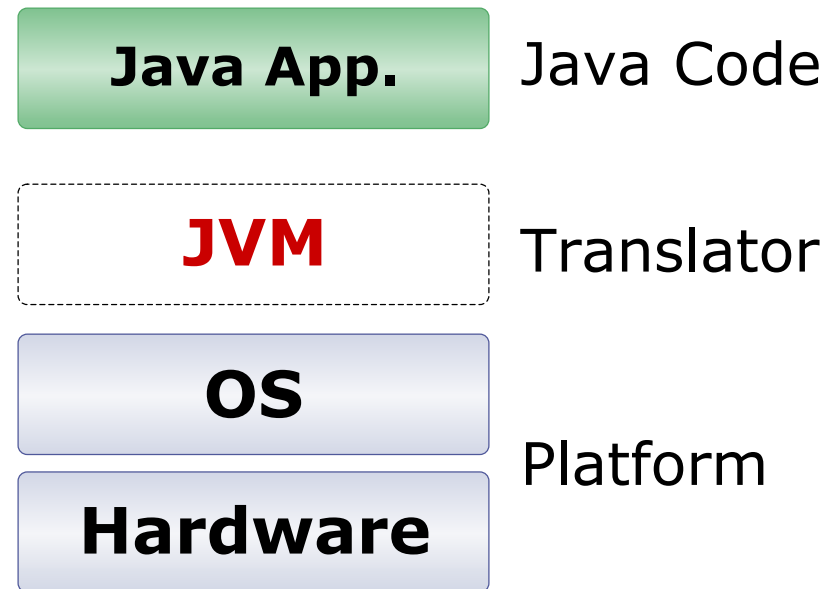
BEA WebLogic JRockit Changes The Game!

WebLogic JRockit is the first independently available JVM optimized for Intel platforms, enabling high performance on low cost, standards-based infrastructure

THE Benefits Of
BEA WebLogic JRockit 8.1

- **Industry Leading Performance**
  - The highest performing JVM on Intel architectures for both Windows and Linux!

- **Industrial Strength Reliability**
  - Continued high performance of applications under heavy user and transaction loads

- **Unique Monitoring Capabilities**
  - Real-time monitoring of Java applications—the JVM is no longer a "black box"

Java App.

WebLogic Platform
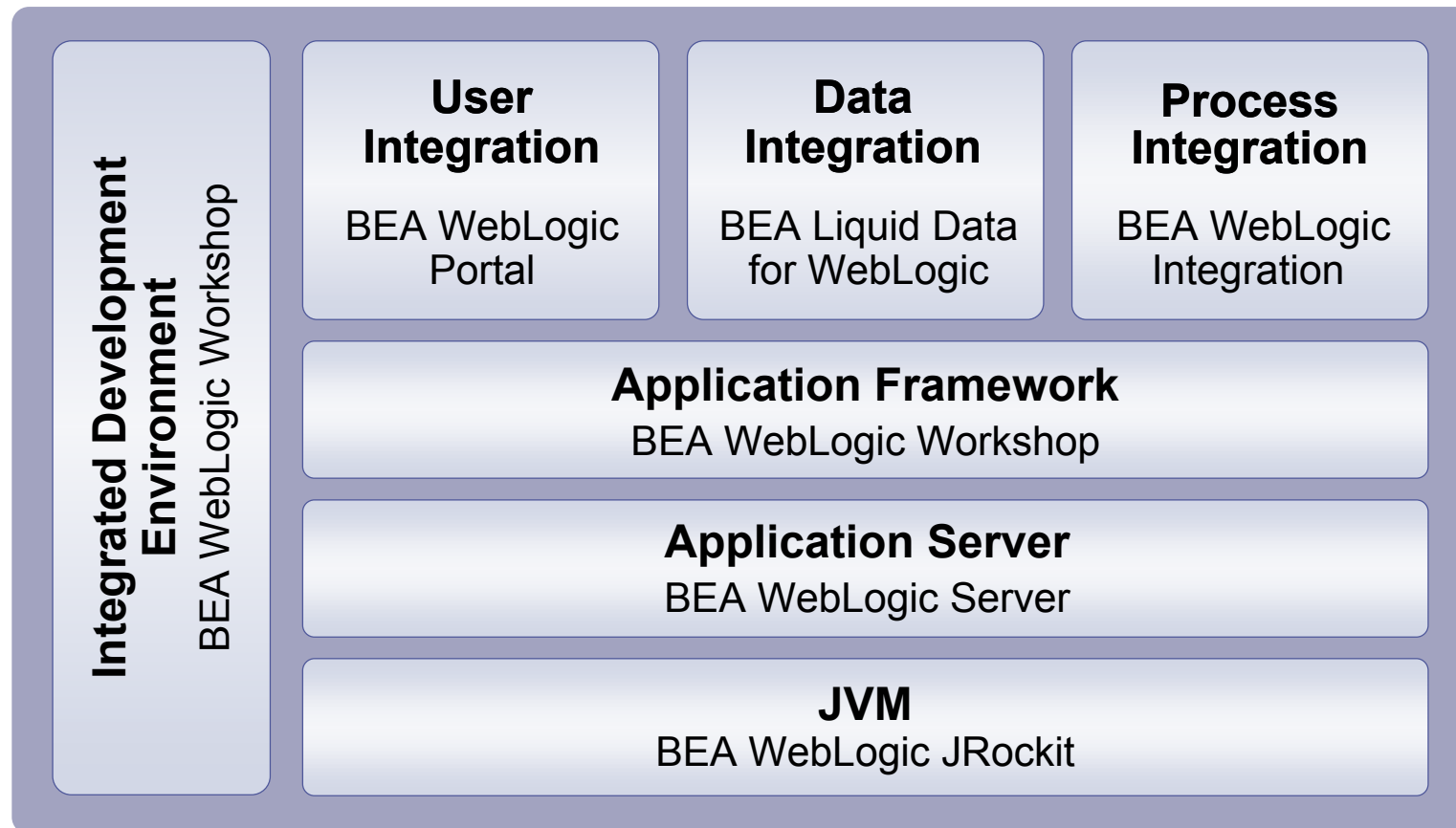
JRockit

Win/Linux

IA32/IA64

Lower TCO!

BEA WebLogic JRockit Vision

"The Java Operating Environment"

1	Focus on enterprise applications

2	Enable true hardware independence

3	100% compatible with J2SE specs.

WebLogic JRockit Is A Critical Part Of The BEA Enterprise Application Platform

| Integrated Development Environment BEA WebLogic Workshop	User Integration BEA WebLogic Portal	Data Integration BEA Liquid Data for WebLogic	Process Integration BEA WebLogic Integration
	Application Framework BEA WebLogic Workshop		
	Application Server BEA WebLogic Server		
	JVM BEA WebLogic JRockit		

- Bundled as part of BEA WebLogic Server 8.1 and WebLogic Platform 8.1
- Freely downloadable as a standalone product

The Java Operating Environment

- Optimize ALL parts of the VM
  - Code generation
  - Memory management
  - Thread management
  - I/O
  - Reflection
- Full adaptive optimization
  - Runtime behavior of applications
    - Heap size, lifetime, # threads, network & IO activity, pause times
  - Underlying OS & H/W
    - # CPUs, CPU architecture, OS threading model, available memory
- Break open the "black-box"
  - Real-time application monitoring & management
- 100% compatible with J2SE 1.4.1 and switchable with other JVMs
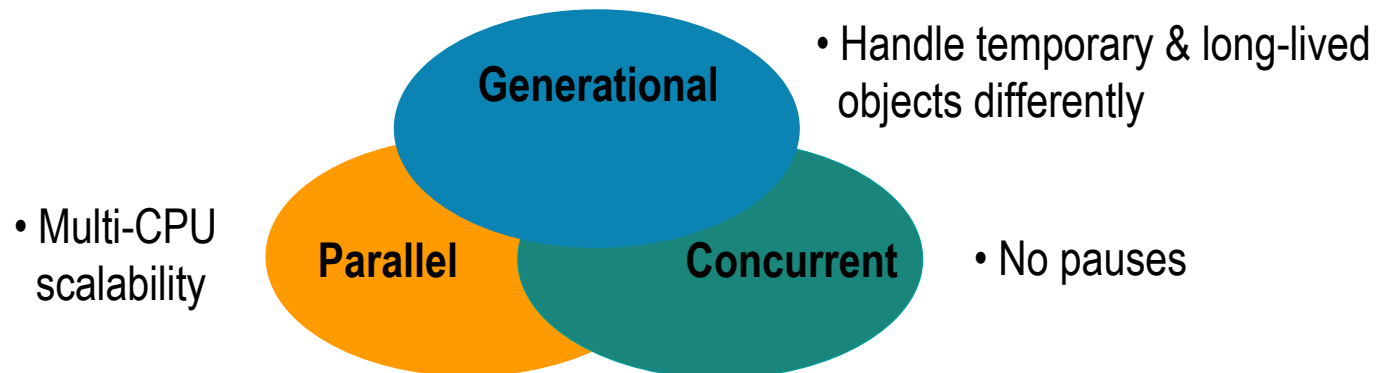
Typical Client VMs
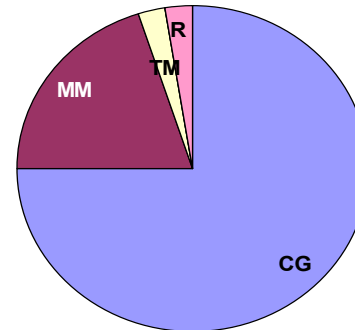
Typical Server VMs
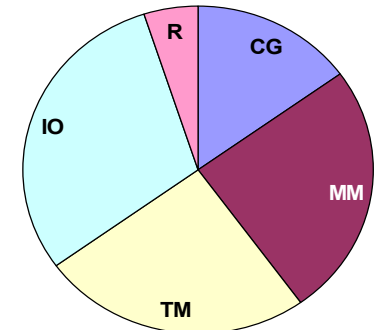
Flexible Design To Suit All Applications

- Dynamic code generation
  - No interpreter
  - JIT compile methods at startup for high performance
  - Dynamically optimize frequently called methods

- Multiple garbage collectors
  - High throughput, but can tolerate some pauses
  - No pauses, but sacrifice some performance

• Multi-CPU scalability

Generational

Parallel

Concurrent

• Handle temporary & long-lived objects differently

• No pauses

Manageability Features

- Built-in framework for real-time monitoring and management
  - Monitor application & system performance
  - Supervise JVM health to avoid catastrophic failures
- JVMDI to support debugger tools
- JVMPI to support profiling tools
- Management console for remote monitoring
- Java Management APIs exposed via JMX interface through WLS console

Real-Time Management Console

- Monitor
  - GC pauses, memory usage, CPU usage, thread tracking
  - Get callbacks before OutOfMemory
- Manage
  - Thread-CPU binding
  - Dynamic code optimization On/Off

Method Profiler
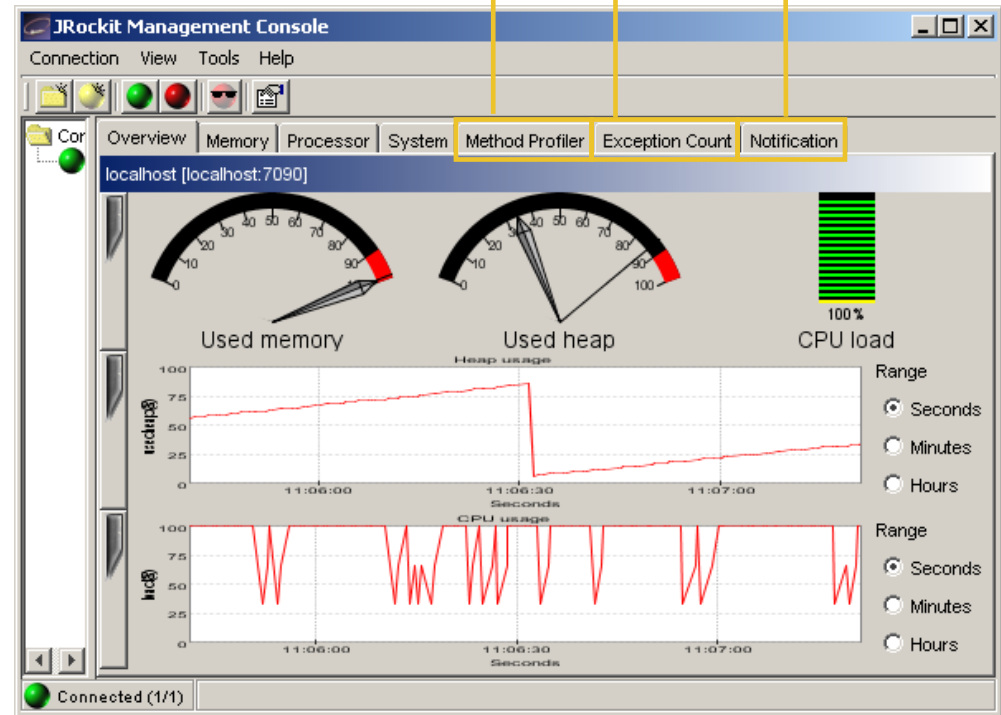- Monitor method invocation
- Time spent in methods
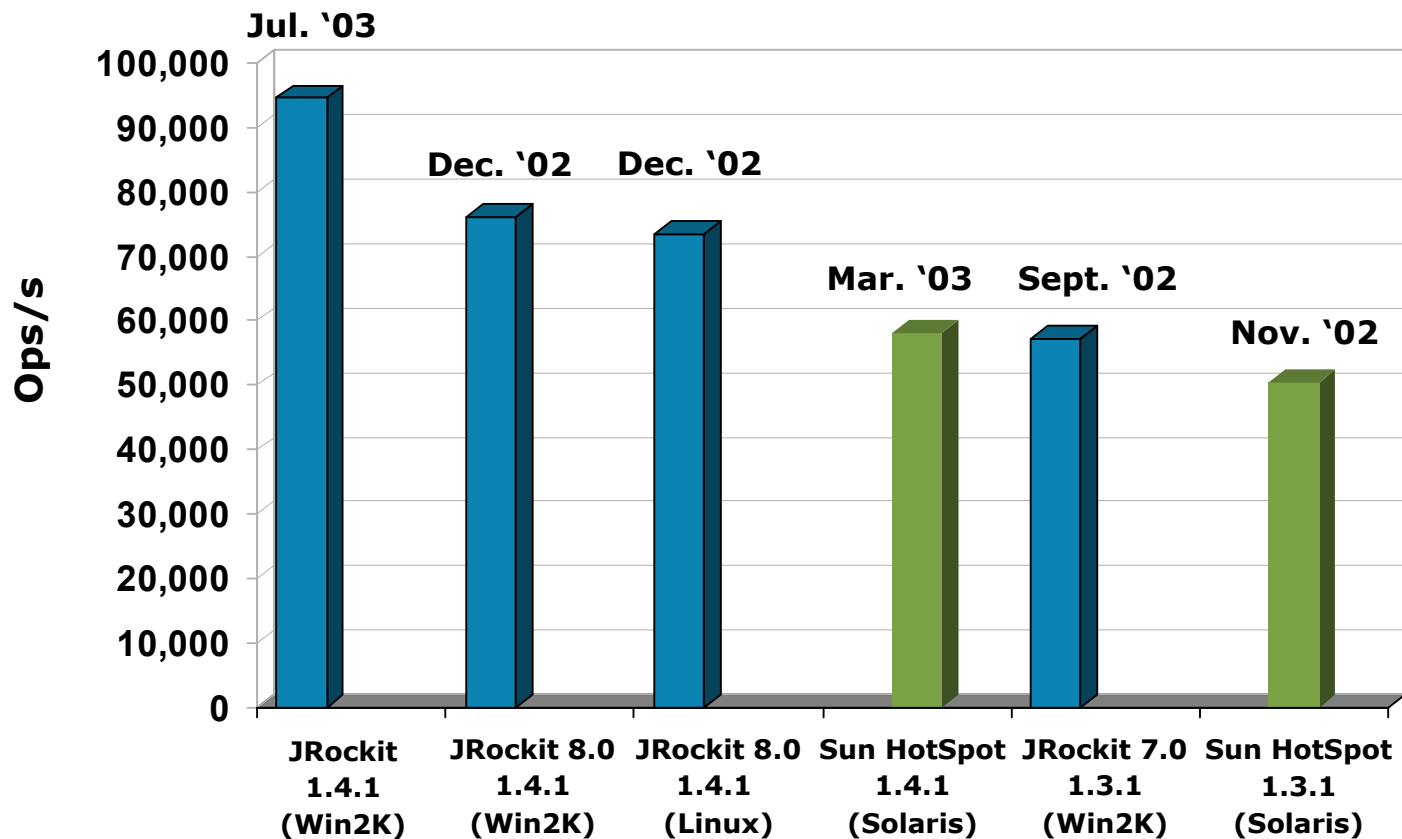
Exception Count
- Track method exceptions

Notification
- Rules-based notification

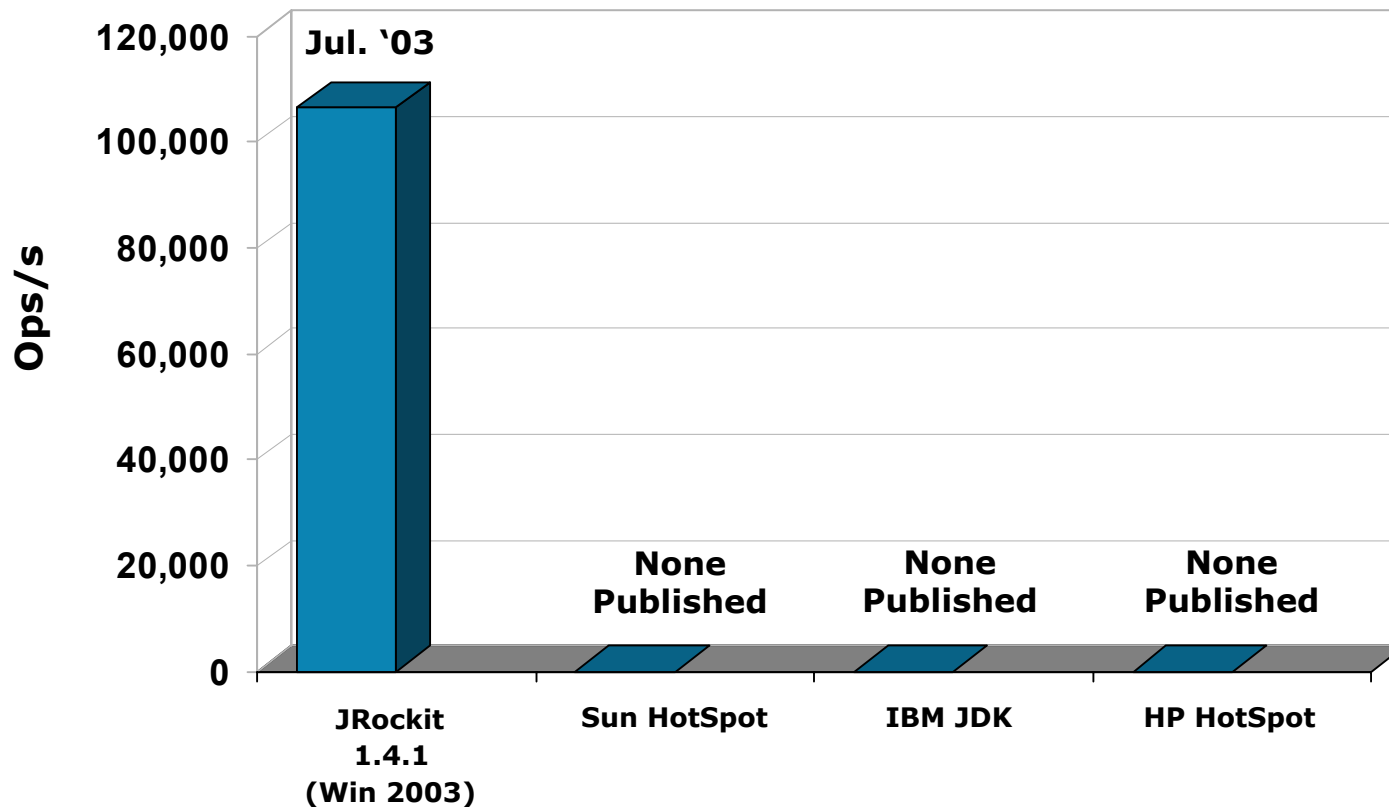# Fastest JVM For 32-Bit Intel Systems

BEA WebLogic JRockit on Intel >60% Faster than HotSpot on SPARC

Sources: SPEC JBB2000
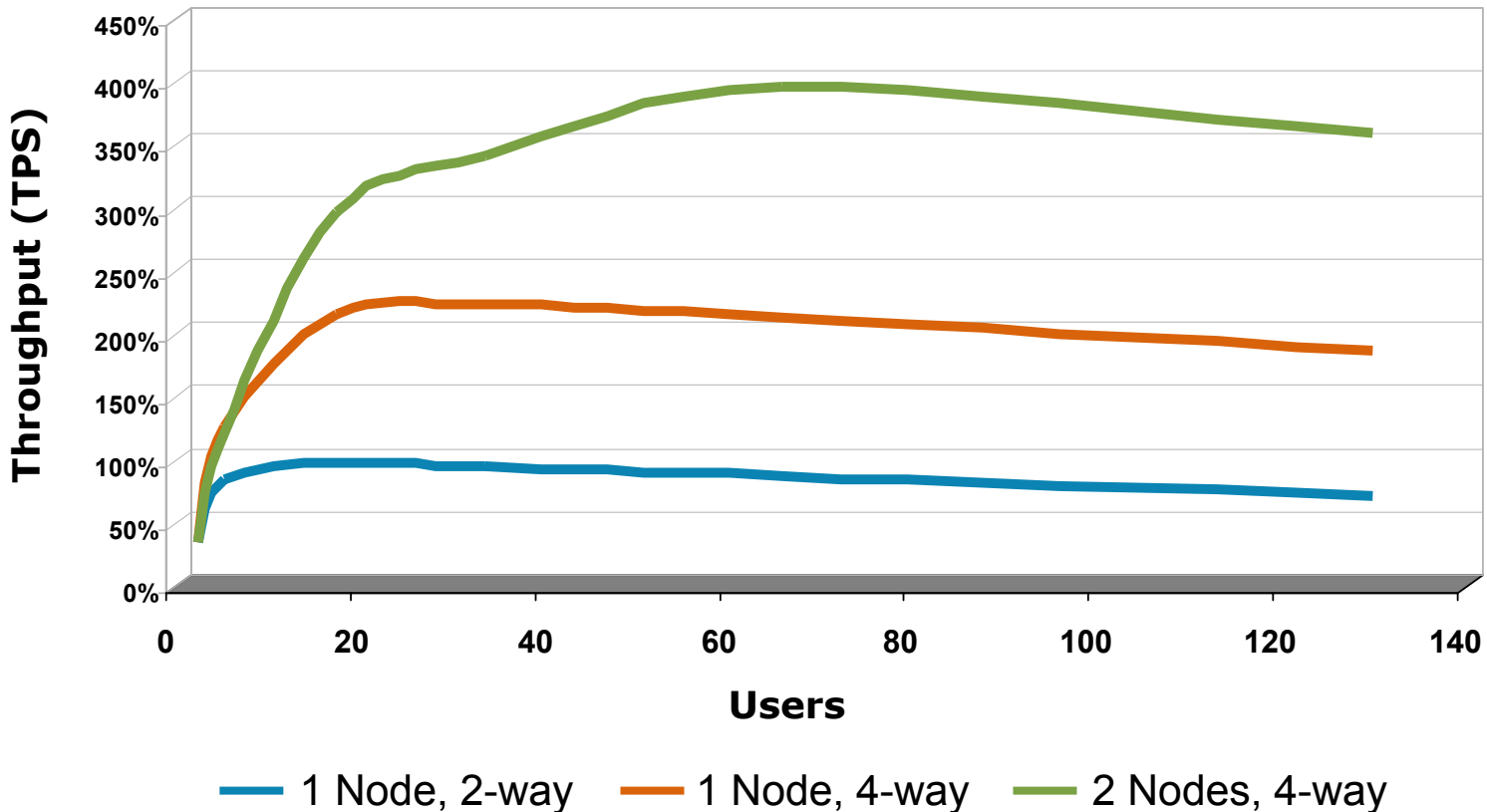Comparison on 4-way servers

Fastest 64-Bit JVM for Intel Itanium Systems

BEA WebLogic JRockit is the ONLY viable 64-bit JVM for IA64

Sources: SPEC JBB2000
Comparison on 4-way servers

Linear Application Scalability

Avitek MedRec application
WebLogic Server 8.1 on JRockit 8.1
Red Hat Enterprise Linux AS 2.1
Dell Precision 420 and PowerEdge 6450

JRockit Product Availability & Roadmap

	JRockit 7.0 SP3	JRockit 7.0 SP4	JRockit 8.1 SP1	JRockit 8.1 SP2	JRockit 1.4.2	JRockit 8.1 SP3
J2SE compatibility	1.3.1	1.3.1	1.4.1	1.4.1	1.4.2	1.4.2
Availability	June '03	Q3 2003	July '03	Q4 2003	Q4 2003	Q1 2004
Windows 2000 (IA32)	X	X	X	X	X	X
Windows Server 2003 EE (IA32)				X	X	X
Windows Server 2003 EE (IA64)			X	X	X	X
Red Hat Ent. Linux 2.1 (IA32)	X	X	X	X	X	X
Red Hat Adv. Server 2.1 (IA64)			X	X	X	X
SuSE Linux ES 8 (IA32)			X	X		X
SuSE Linux ES 8 (IA64)			X	X		X

Future Focus Areas

- Developer productivity
  - Reduce startup time
  - Application and code analysis
- Continued performance work
  - Significant IA64 performance improvements
- Simplify configuration and tuning
  - Unified GC, dynamic self-tuning
- Manageability
  - JVMTI
  - JRockit Management and Monitoring APIs
  - Further integration with WLS console and 3rd party tools
- Continued stability improvements
- J2SE 1.5

Demo

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