



eBay Builds High-Performance Event Processing Applications

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Enterprise Architecture

eBay

About eBay



- Founded in 1995
- 241 million registered users
- Annual revenue of \$7+ billion*
- Global presence in 38 markets worldwide
- Diversified Internet business model
 - PayPal
 - Rent.com
 - Shopping.com
 - Skype
 - World's most popular online auction site
 - Six online classified sites
 - Minority stake in craigslist

IT is the Business



eBay Marketplace → Millions of Dollars in Transactions per Min.

Business Metric	IT Metric	IT Implication
Revenues	-Thousands of transactions/second	Application uptime is critical
Customer Satisfaction	-Updates reflected in real-time -Near real-time page response	Application performance is critical
Growth	-Million+ messages per second -New features added daily	Ability to immediately adapt – scalable & manageable IT architecture
Cost Containment	-Software, hardware & support costs -Support cost $\$ \Delta < \text{revenue growth } \$ \Delta$	Applications managed to peak efficiency

Solution: Event Driven Processing



BEA WebLogic Event Server provides the event processing framework

- Lightweight Java application server for high-performance, event-driven applications
 - Built-in complex event processing (CEP) engine
 - Events = meaningful state changes that are unpredictable and could potentially trigger other activities
- Discern complex event patterns or correlations across different event sources and/or over a period of time
- Microsecond latency/performance for real-time responsiveness
- Lightweight Java Container
 - Small footprint for faster time-to-production and lower TCO
- Ability to support 10,000+ rules
- microService Architecture
 - Application and system upgrades less disruptive

Use Case: Heartbeat & Event Monitor



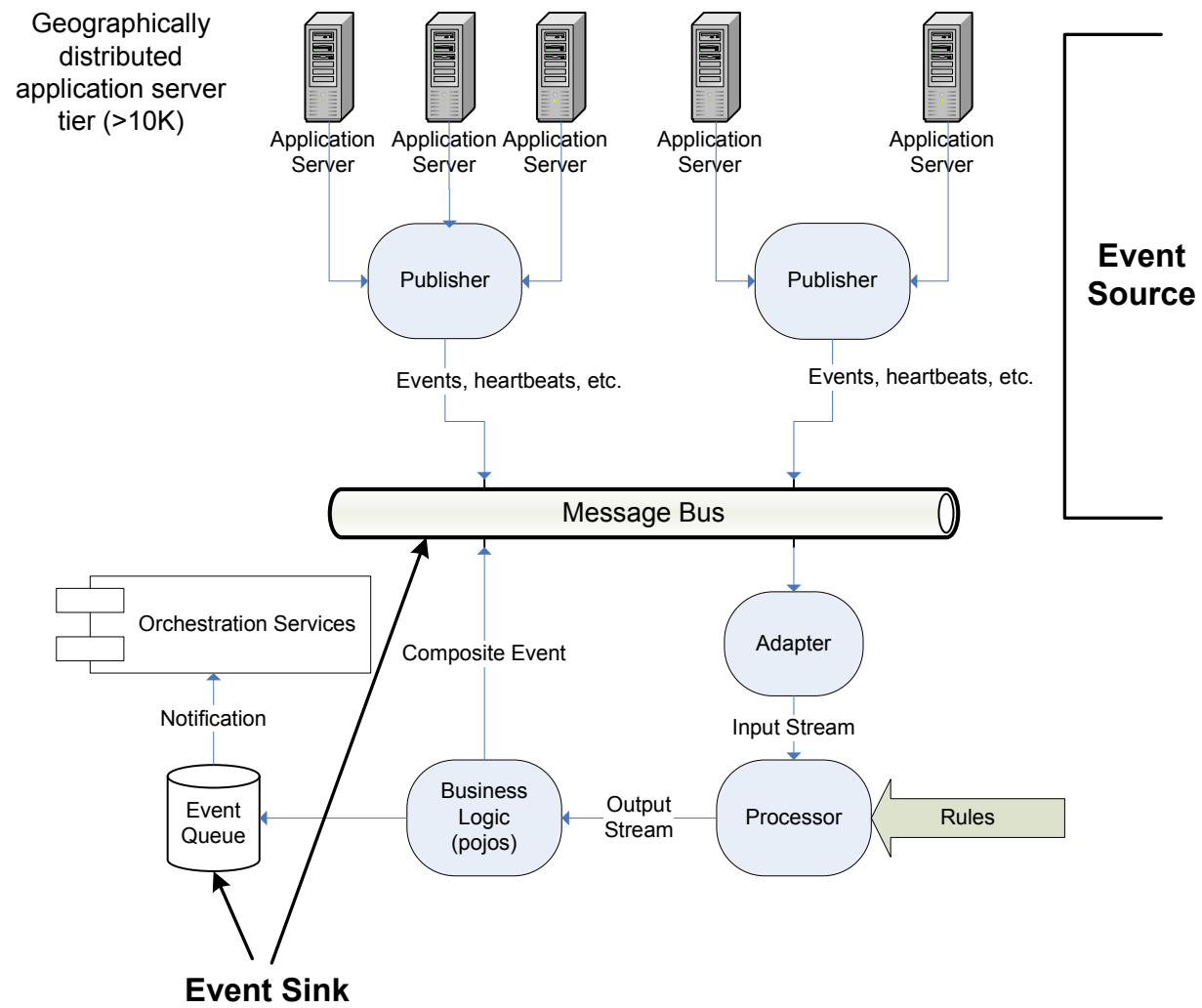
- Situation
 - The Business – eBay Marketplace
 - Impact – \$1,840 of transactions per second
 - IT Imperative - Cannot afford the slightest downtime
- Complication
 - 10,000+ servers geographically distributed
 - Each server provides “heartbeats” and health stats every second to confirm application health
 - If a server stops sending heartbeat or issues critical events, it is critical to identify and resolve the issue immediately
 - Risk of overloading other servers and creating crisis situation
- Solution Explored – BEA WebLogic Event Server
 - Receives heartbeats from eBay specific TIBCO message bus
 - Analyze message stream to determine absence of heartbeat or critical event
 - Raises context sensitive alarms

Benefits of Event Driven Processing



- Proactive monitoring & management
 - Detect, isolate and resolve problems quickly
 - Maintain optimum application & system performance
 - Avoid potentially costly downtime or service unavailability
- Service-level agreements
 - Empower Site Operations to promise and support more aggressive SLAs
 - Drive more revenue by enabling business to offer innovative services
 - Improve customer satisfaction/retention
- Cost savings
 - Performance optimization allows for maximum utilization of assets
 - No need to over-provision assets to ensure adequate performance and availability

Event Driven Architecture



What BEA Provides



- High Performance
 - Ability to satisfy aggressive throughput and latency requirements
 - Complex event processing with real-time performance
 - Scalable
- Extensible architecture
 - Framework approach enables integration with eBay's vast array of systems and support tools.
 - Pluggable architecture enables reuse and pattern based approach for common event detection scenarios
- Open, standards-based Java infrastructure
 - Java based solution leverages core eBay development expertise
- Dynamic development and runtime environments
 - Flexible rule definition enables dynamic rule changes with near real-time updates

Projected Results



- Support cost control / savings
 - Order of magnitude growth in the number of messages per second/per server without increased H/W and S/W costs
 - Support for continued growth in application functionality without linear growth in support costs
- Greater Site Operations manageability of the IT infrastructure
 - Pro-active control of the Application via event detection
 - More aggressive availability and performance SLAs possible
- Scalable event processing architecture
 - Simplified, repeatable integration
 - Ability to leverage common, eBay development resource pool
 - Could enable common event-driven infrastructure for organization
- Freedom to deploy best-of-breed solutions
 - C++ throughput and latency performance using open, standards-based Java infrastructure
 - Prevent over-reliance on proprietary technologies

Potential Business Implications



- Scalable IT foundation to support rapid business growth model
- Support business need to deliver innovative services and effectively maintain existing services
 - Faster time to market
 - Increased revenue
- Improve customer satisfaction/retention
 - Support aggressive application availability requirements
 - Improve/sustain performance SLAs
- Sustainable support costs decoupled from revenue growth