



## ORACLE EVENT PROCESSING FOR ORACLE JAVA EMBEDDED

INDUSTRY-LEADING EMBEDDED  
EVENT PROCESSING SOLUTION

### KEY FEATURES

- High-speed real-time data capture and analysis optimized for embedded devices
- Supports high throughput (hundreds of thousands of events per second) and low latency processing
- Comprehensive event processing query language based on standard SQL syntax
- Visual and Java-based development tooling for defining event processing applications and networks
- Pre-integration with best-in-class Oracle Java Embedded platforms

*Oracle Event Processing (OEP) for Oracle Java Embedded is a solution for building embedded device applications to filter, correlate and process events in real-time so that downstream applications, services and event-driven architectures are driven by true, real-time intelligence. OEP for Oracle Java Embedded enables the design, definition, development and implementation of event processing applications that not only meet embedded device requirements, but perform to the highest levels of today's intelligent systems. Based on the Oracle Event Driven Server technology, OEP for Oracle Java Embedded provides an optimized low memory and disk footprint version of the enterprise edition OEP platform. It is built on industry-standards including Java, ANSI SQL and OSGi™. With a powerful Java development tooling, OEP for Oracle Java Embedded ensures that your development team can build event-driven applications on the edge without the hurdle of specialized training or unique skill-set investment.*

### Introduction

The accelerated growth of the “Internet of Things” (IoT) is driving demand for increased capabilities to collect and process data from a proliferation of embedded devices. At the same time, the quantity and speed of business events is growing exponentially. Whether it is streaming machine data for factory automation, streaming satellite data for the military or real-time location data for transportation and logistics, customers in multiple industries must handle large volumes of complex data in real time. These trends are increasing the customers needs to expand their capability to support event-driven architecture through to the edge devices. Real-time event processing requires both the infrastructure and the application development environment to execute on event processing requirements. These requirements are driving the need to scale from legacy system to enabling intelligence directly on devices in the field to capture high velocities of data and event throughputs, being able to react to the critical events in real-time without affording latencies associated with backend processing.

## BENEFITS

- Enables real-time situational awareness, faster decisions and immediate actions locally at the machine level, ensuring better customer satisfaction and retention, driving higher revenues
- Decrease costs and improve compliance with the real time analysis of data patterns, identifying and proactively responding to critical events and threats
- Cost savings in terms of network bandwidth and processing power in the backend. Plus greater autonomy and resilience in case of connectivity loss to network
- Improve operational efficiency with immediate insight into supply chain, integrated systems and processes, facilitate dynamic optimization of resource utilizations
- Provide low TCO and increase productivity with a complete rapid development and deployment platform for event-driven solutions requiring complex event processing on the edge devices

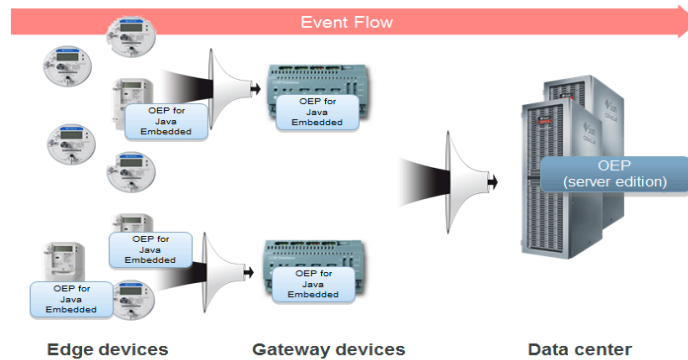


Figure 1 Cascading Oracle Event Processing Architecture

## Sample Use Cases

OEP for Oracle Java Embedded targets a wealth of industries and functional areas. Following are some use cases:

*Industrial Automation:* High speed data collection and analysis, local storage and analysis, filtering, correlation, pattern matching.

*Management appliances:* Ability to detect events from various sub-systems and determine downstream process

*Transportation & Telemetry:* Location tracking, container content monitoring, intrusion detection, temperature and pressure monitoring

*Healthcare:* Data evaluation, analysis, monitoring, automatic alerts and care-flow processing

*Smart Retail Vending Machines:* Inventory management, demand-based handling and pricing

## Streaming Event Processing

OEP for Oracle Java Embedded provides the ability to join incoming streaming events with persisted data, thereby delivering contextually aware filtering, correlation, aggregation and pattern matching. OEP for Oracle Java Embedded can be integrated with lightweight adapters for common event sources such as sockets and JMS messages, while also providing an easy to use framework for custom adapter development.

Today's intelligent devices process a multitude of data and require the capability to easily capture, analyze and process vital information. With OEP for Oracle Java Embedded customers can identify and anticipate opportunities, and threats represented by seemingly unrelated events.

- Detects related events that, for example, have the following characteristics:
  - Correlated events: If event A happens, event B almost always follows within 2 seconds of it.
  - Causal events: Event 'manufacturing process halted' will result in event 'delayed shipment.'
- Generates optimal downstream events, based on customer-specific inference queries, in response to a combination of upstream events.

## Standards-Based Continuous Query Language

In addition to real-time event sourcing, the OEP for Oracle Java Embedded design environment and runtime execution supports standards-based, continuous query execution across both event streams and persisted data stores like databases and high performance data grids. This enables

**RELATED PRODUCTS**

- **Java SE Embedded**
- **Java ME Embedded**
- **JavaFX**

Oracle is a leader in the embedded Java market, offering an extensive family of Java platforms which support a wide range of embedded environments with varying requirements in terms of memory constraints, chipsets, OS's and industry vertical specific requirements. The Java platforms are specifically designed to meet the needs of different classes of devices; Java Card (from 16Kb/8Kb ROM/RAM), Java ME (160Kb+), and Java SE (from low MB to unlimited). Oracle is also the number one embedded database vendor on the market for resource constrained environments.

OEP for Oracle Java Embedded to act as the heart of intelligence for systems, differentiating between those needing answers in microseconds or minutes, to discern patterns and trends that would otherwise go unnoticed. Event Processing use cases require the high speed processing with the mathematical accuracy and reliability of standard database SQL. OEP for Oracle Java Embedded queries listen to incoming event streams and execute registered queries continuously, in-memory on each event, utilizing advanced, automated algorithms for query optimization. While based on an in-memory execution model, however, OEP for Oracle Java Embedded leverages standard ANSI SQL syntax for query development, thus ensuring accuracy and extensibility of query construction. OEP for Oracle Java Embedded is fully compliant with the ANSI SQL '99 standard and is the first product available in the industry to support ANSI SQL reviewed extensions to standard SQL for real-time, continuous query pattern matching.

**Event Processing Programming Model**

The OEP for Oracle Java Embedded Event Processing Network allows for both Continuous Query Language (CQL) and Java code to be combined to deliver robust event processing applications and is at the heart of the OEP for Oracle Java Embedded programming model. Leveraging standard industry terminology to describe event sources, processors, and event output or sinks, OEP for Oracle Java Embedded provides a meta-data driven approach to defining and manipulating events within an application. This means real-time updates with no re-compilation, no updates to binary, and no restart required. OEP for Oracle Java Embedded developers use an Eclipse IDE plug-in with a visual, directed-graph canvas and palette for application design to quickly outline the flow of events and processing across both event and data sources. Developing the flow through drag and drop modeling, the developer can then enter the appropriate metadata definitions to connect design to implementation. This provides a consistent application design approach for both Enterprise and Embedded implementation solutions.

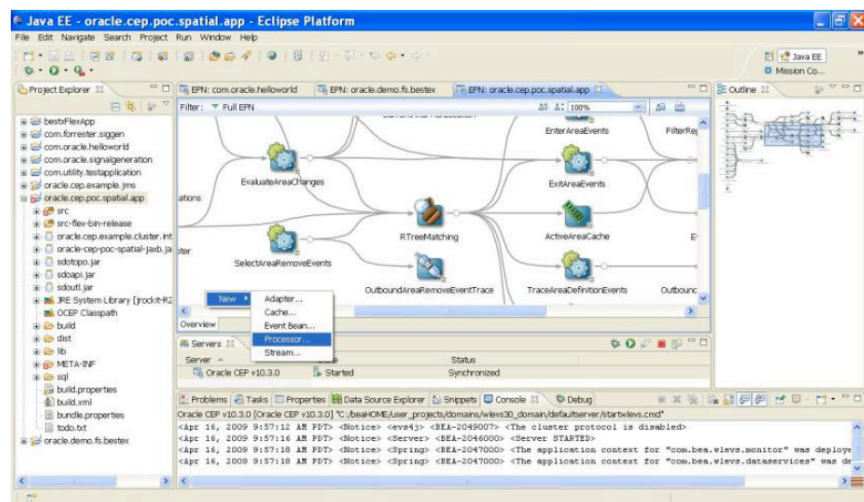


Figure 2 Visual Event Processing Network Application development environment

**Integrated industry-leading embedded Java application platform**

OEP for Oracle Java Embedded has the ability to handle millions of events per second with microseconds of processing latencies. This is achieved through a complete layered solution, not only with a design focus on high performance event processing use cases, but also a tight integration with the industry-leading embedded Java application platform. It delivers a commercial grade Java Machine-to-Machine (M2M) platform focused on reliability and

scalability enabling customers to predictably deploy business-critical embedded applications.

To satisfy the needs of today's intelligent system, OEP for Oracle Java Embedded is packaged to run on Java SE Embedded.

### Supported Platforms

For specific product requirements, refer to the following documentation hub: [oracle.com/technology/documentation/index.html](http://oracle.com/technology/documentation/index.html)

OEP for Oracle Java Embedded Supported Platforms		
CPU	ARM v6 and v7	x86
OS	Linux Kernel 2.6.28 or higher; glibc 2.9 or higher	Linux Kernel 2.6.28 or higher; glibc 2.9 or higher
FP	VFP	Hard
RAM	256MB or more for Java	256MB or more for Java
ROM/ Flash/ Disk	128MB or more for Java	128MB or more for Java

### Contact Us

For more information about Java Embedded products, please visit [www.oracle.com/goto/javaembedded](http://www.oracle.com/goto/javaembedded) or call +1.800.ORACLE1 to speak to an Oracle representative.



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