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Esper JDBC

Interoperability for the Esper CEP engine

Esper JDBC

- Server + Client building blocks
  - Server side JDBC enablement: Esper JDBC (server behavior)
  - Client side JDBC enablement: Esper JDBC driver (single jar file, ~100KB)
  - Esper JDBC driver is « Type 4 » (full Java)
- Java Database Connectivity (JDBC)
  - A set of industry defined standards and API (Java Specification)
  - To enable interop between Java and external *systems of records* like a Database, but also like a CEP server
- No proprietary vendor lockin code on the client side
  - Drivers are loaded by name
  - The API is fully standardized

    import java.sql.;*
  - Esper JDBC is JDBC 3.0 / JSR-54 / SQL-92 compliant (partial)
- Very large set of knowledge sources available

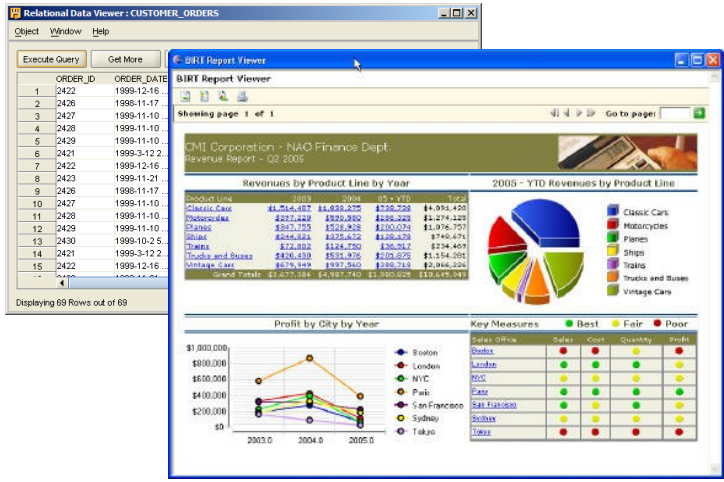
Esper JDBC

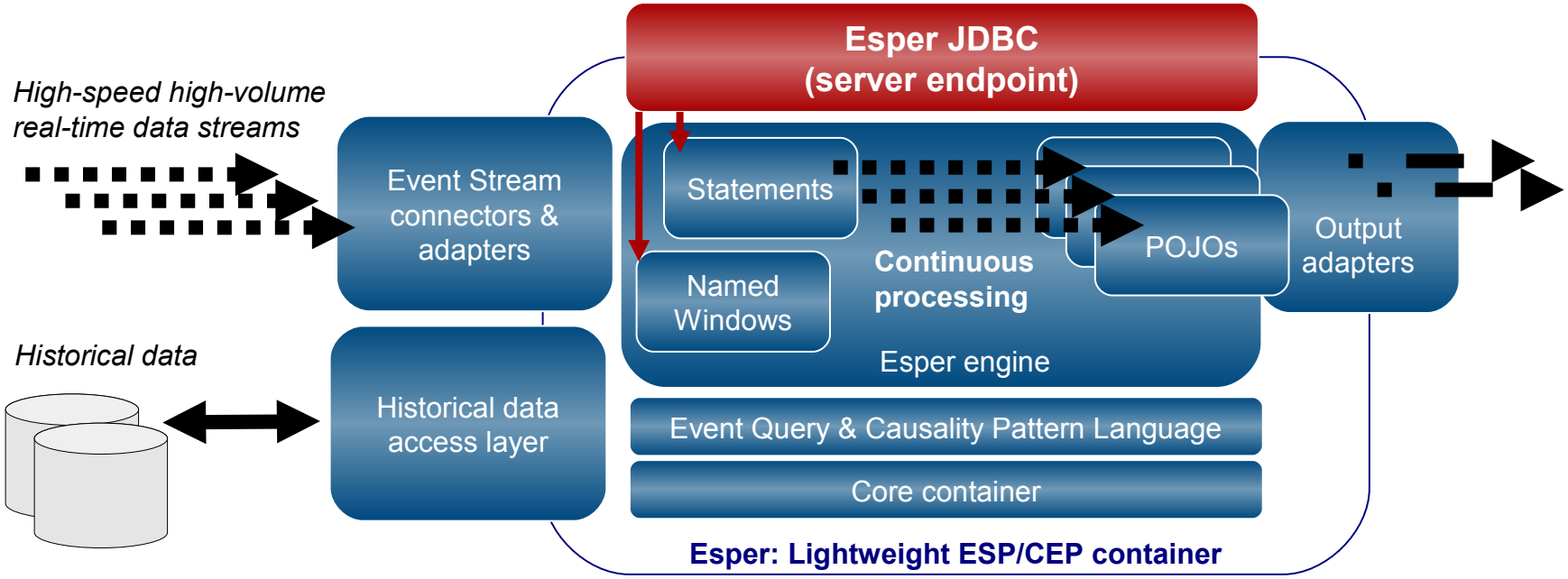
- Turns Esper into a JDBC compliant server
  - Get an on-demand view on the data continuously computed by Esper
  - Remotely or Locally
- Leverage well known paradigms
- Ensure interoperability with existing tools and infrastructure

Concept	How	Esper	RDBMS analogy
On-demand query	***select … from …*** SQL-92 compliance	Named Window	Table
On-demand computation	***call …***	EPL Statement result (Iterator)	Stored Procedure
Namespace	***catalog***	Engine instance URI	Schema

Sample Esper JDBC use cases

- On-demand query for analysis & troubleshooting
- Point and click integration with any reporting tool





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Esper JDBC Server and Client

- Esper (server) must start an Esper JDBC server endpoint
  - IP, Port (defaults to 8450), session idle timeout, threads

```
JDBCEndpointConfiguration config = new JDBCEndpointConfiguration();
config.setListenPort(8450);
config.setSessionIdleTimeout(60); // 60-second idle timeout
JDBCEndpoint endpoint = new JDBCEndpoint(config);
endpoint.start();
```

- Esper JDBC driver
  - JDBC Driver and URL or DataSource

```
Class.forName("com.espertech.esper.jdbc.remote.EPLRemoteJdbcDriver");
String url = "jdbc:esper:remote:127.0.01:8450"; // hostname:port
Connection connection = DriverManager.getConnection(url);

// or using Esper JDBC Data Source
EPLRemoteDataSource remoteDataSource = new EPLRemoteDataSource();
remoteDataSource.setServer("myhostname");
remoteDataSource.setPortNumber(8450);
Connection connection = remoteDataSource.getConnection();
```

Example: Named Window over JDBC

- Esper Named Window
  - A continuous view on a stream
  - Esper JDBC enables SQL-92 select
    select … from [Named Window] where ….

```
// Esper EPL (server side)
create window TickSummary.win:time(60 sec)
as select symbol, price from Tick

// JDBC (client side)
// import java.sql*;
String query = "select * from TickSummary where symbol = 'GOOG'";
PreparedStatement stmt = connection.prepareStatement(query);
ResultSet rs = stmt.executeQuery();
//... code to interrogate the result set
… rs.next();
… rs.getDouble("price");
```

Example: EPL Statement results over JDBC

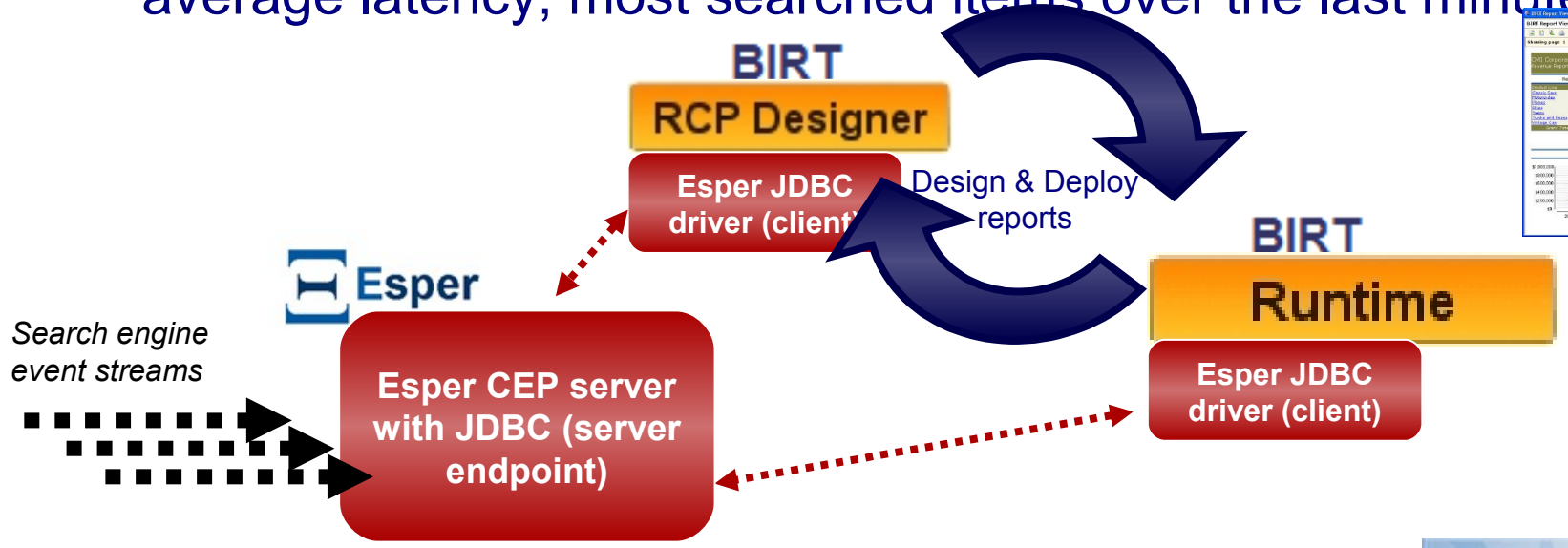
- Esper EPL Statement
  - A continuous query on real-time streams
  - Esper JDBC enables SQL-92 stored procedure call
    call [EPL Statement name]

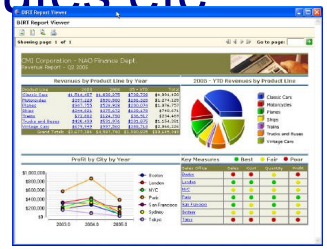
```
// Esper EPL (server side)
select symbol, avg(price) as avp from Tick group by symbol
// assume statement name is avgPriceBySymbol

// JDBC (client side)
// import java.sql*;
String epl = "avgPriceBySymbol";
PreparedStatement stmt = connection.prepareStatement(epl);
ResultSet rs = stmt.executeQuery();
//... code to interrogate the result set
… rs.next();
… rs.getDouble(“avp”);
```

Demo

- A large bookstore search engine
- Esper CEP used to extract continuous KPI of search count, average latency, most searched items over the last minutes etc





- Steps
  - Simple query over any JDBC compliant tool
  - Integration of KPI in end-user visual friendly reports

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Demo

- Example Named Windows

```
create window SearchRequests.win:time(1 min) as select * from SearchRequest
```

- Example EPL Statements

```
select serviceName, count(*)
   from SubmittedWorkEvent.win:time(60 sec) group by serviceName
   output every 1 seconds

select serviceName, instanceId, avg(msecClockTime), count(*)
   from CompletionEvent.win:time(60 sec) group by serviceName, instanceId
   output every 1 seconds

select serviceName, avg(msecClockTime), count(*)
   from CompletionEvent.win:time(60 sec) group by serviceName
   output every 1 seconds

select queueName, avg(depth)
   from QueueReportEvent.win:time(60 sec) group by queueName
   output every 1 seconds
```

Thank you

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