# StreamBase Training

## *Developing CEP Applications with StreamBase EventFlow*


### TRAINING OVERVIEW

**Course Duration**

2 days running from 9am to 5pm each day.

**Course Format**

- Instructor-led lecture, classroom discussion, problem-solving, hands-on application development.
- Instructors are experienced StreamBase application developers.

**Intended Audience**

The course is designed primarily for application developers who want to use StreamBase EventFlow to author complex event processing applications. No prior experience with StreamBase or CEP is required.

**Course Description**

The goal of this course is to learn how to solve problems using StreamBase. The course provides an introduction to complex event processing (CEP) and the StreamBase paradigm as a way to address problems related to the analysis of large amounts of data in real-time.

The course begins with an introduction to the StreamBase Event Processing Platform and StreamBase Studio, which is a comprehensive development environment. Students learn how to build a simple application. From there, students learn more about StreamBase EventFlow, the graphical programming language for implementing CEP applications.

**Course Objectives**

Upon completion of this course, the student should be able to:

- Think about problem solving in terms of complex event processing.
- Identify the components that make up the StreamBase architecture.
- Use the StreamBase approach to application design.
- Use StreamBase Studio to create and run EventFlow applications, going from simple to more complex and modular designs.
- Load a StreamBase application, execute it, and view its results.
- Test and debug StreamBase applications
- Use EventFlow to build applications that can:
  - Use manual input, an input file, or a feed simulation for testing.
  - Reformat, process, and reconfigure incoming data.
  - Extract selected content from a data stream.
  - Create multiple output streams from a single input stream.
  - Specify windows of data from streams that can be aggregated and analyzed.
  - Use query tables to store information.
  - Combine data arriving from multiple data streams.

TRAINING SYLLABUS

## Day 1: Concepts, Simple Applications, and Query Tables

### Section 1 – Complex Event Processing (CEP) and the StreamBase Paradigm

- Introduction To CEP
- Introduction To StreamBase Concepts
- StreamBase Ecosystem Overview
- Typical Development Lifecycle
- Defining Problems In StreamBase Terms
- Introduction To StreamBase Studio
- Designing And Developing A Basic Application
- Getting More Information: Help, Docs, Samples, Component Exchange

### Section 2 – StreamBase EventFlow Language Concepts

- Introduction To Sample Applications
- Streams: Input, Output, and Arcs
- Events, Tuples, Schemas, and Data Types
- StreamBase Expression Language and Functions
- Frequently Used StreamBase Operators: Map, Filter, Union, Sequence, and Split
- Hands-on Exercises: Simple Applications Using StreamBase Operators

### Section 3 – Query Tables

- Working With Query Tables
- Indices and Table Schemas
- Introduction To The Query Operator
- Writing Data To A Query Table
- Reading Data From A Query Table
- Deleting Data From A Query Table
- Specifying Output From A Query Operator
- Table Update Notification Using Delta Streams
- Hands-on Exercises: Query Tables

## Day 2: Aggregation, Testing, Complex Types, and Modularity

### Section 4 – Aggregation

- Understanding Windows
- Working With The Aggregate Operator
- Aggregation Dimensions: Open, Close, and Emit
- Dimension Types: Tuple-based, Time-based, Field-based, and Predicate-based
- Intermediate Emission and Group By
- How The Aggregate Operator Uses Functions
- Hands-on Exercises: Aggregation

### Section 5 – Testing and Debugging

- StreamBase JUnit Testing
- Debugging and Debuggers
- Tracing
- Record, Playback, and Feed Simulation
- Hands-on Exercises: Testing and Debugging

### Section 6 – Complex Data Types: Tuples and Lists

- Nested tuples
- Creating tuples
- Schema refactoring
- Lists
- Iterate operator
- Hands-on Exercises: Tuples and Lists

### Section 7 – Modular Applications

- Modules
- Shared Query Tables
- Interfaces
- Extension Points
- Hands-on Exercises: Modular Applications

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