In a few words

- Reactive event driven actors (micro-service), communicating data through data-stream pipes, controlled by the application orchestrator.
- Stream of data quanta, flowing through directed graph of actors.
- Application is a network of independent actors.

- Data moves across actors not instructions
- Actors communicate with each other by exchanging the data quanta across predefined connections by message passing, where connections are specified externally to actors.
- User provided data processing single-threaded algorithms (engines) are presented as fully scalable actors in the framework.
Actor = User engine + Data processing station (DPS)

- Engine follows data-in/data-out interface.
- Engine gets JSON object for run-time configuration.
Data Stream Pipe

Communication

Publish/Subscribe

P2P

0MQ/POSIX_SHM/Data-Grid

Data-Stream Pipe

Transient Data

• Meta-description
• Serialization

• Topic
• Message-Location
• Envelope
• Shared-Memory Key

• xMsgMeta
• Version
• Description
• Author
• Status
• Severity-ID
• Sender
• Sender-State
• Communication-ID
• Composition
• Execution-Time
• Action
• Control
• Data-Type
• Data-Description
• Reply-To
• Byte-Order

• xMsgData-Object
• Byte-Array

Exception Reporting

Operational Info Reporting
Application Orchestrator

- Application Monitoring, Real-time Benchmarking
- Application Deployment and Execution
- Exception Logging and Reporting
- Command-Line Interface
- Hardware Optimizations
- Service Registration/Discovery
- Data-Set Handling and Distribution
- Farm (batch or cloud) Interface
Advantages of the actor model

• Artifacts are small, simple and independent
  - Easier to understand and develop
  - Reduced develop-deploy-debug cycle

• Easy to migrate to data

• Scales independently

• Independent optimizations

• Improves fault isolation

• Easy to embrace hardware heterogeneity

•Eliminates long term commitment to a single technology stack.
ALICE code is modified to stream data

ERSAP

Aggregator service
Decoder service
JANA-Processor service
Persistency service

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